The Builder.

Vol. XLI. No. 2089. Saturday, December 24, 1881.

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The late G. E. Street, R.A.

ALL our readers will have heard, and all will have heard with great regret, of the sudden and unexpected death of Mr. Street, at the comparatively early age of fifty-seven, and just when he seemed to be at the zenith of his professional success, and was looking forward soon to witness the completion of the greatest work of his life, and the most important English building since the Houses of Parliament. Unexpected his death may be called; for though he had been very ill a short time previously, and the necessity for complete rest and relief from responsibility for a considerable time had become quite obvious as a condition of his recovery, we had had the assurance since then of his friends' belief in his having rallied from his previous attack, and in the prospect of his complete recovery with time, rest, and the change of climate which he had decided on. But this was not to be.

He had experienced a stroke of paralysis on November the 19th, which had given the first warning that his powers had been overtaxed. This was succeeded on Thursday, the 15th of this month, by a more serious recurrence of the same calamity, from the effects of which he did not recover, and which terminated in his decease at his house in Cavendish-place, on the night of Sunday last. His plans had been laid for leaving England for Egypt, in search of rest and recruited health, on the Friday before the day which proved to be his last.

Mr. Street was born at Woodford, in Essex, June 20th, 1824, the third son of his parents, Thomas and Mary Anne Street. In March, 1841, he commenced his professional studies as articled pupil to Mr. Owen B. Carter, architect, of Winchester. In April, 1844, he entered the celebrated studio of Gothic architecture, as it might well be called, in Spring-gardens, and soon drew the attention of Scott as an assistant of unusual ability and promise, and was selected to give special assistance to his principal in the preparation of some of his most important designs. Sir G. Scott gave special testimony in regard to the high value he then set on Mr. Street's assistance, on the occasion of the presentation of the Institute Gold Medal to the latter a few years ago. In 1848 he left Spring-gardens to enter practice on his own account at Wantage. On his appointment as architect to the Oxford Diocesan Commissioners in 1858, he removed his residence to Oxford, and in the same year was married to Mariquita, the daughter of Mr. Robert Procter, of Geys House, near Maidenhead. In 1856 he removed to London, settling, in the first instance, at 33, Montague-place; and in 1863 removed to 5, Russell-square, where he practised till 1870, thus occupying for a considerable time a neighbourhood which has been a favourite one with architects and other artists. Thence he removed to the house which he inhabited till his death, at 14, Cavendish-place. In 1876, having lost his first wife some time previously, he married again, his second wife being Jessie Mary Anne, daughter of Mr. William Holland, whom he had the great and trying misfortune to lose two months after their marriage, and, if we remember rightly, while they were still on their wedding tour,—a calamity which, it may be feared, laid the first foundation of the ultimate breaking up of his formerly robust health and strength. Some other dates in his professional career may also be noted here. It was in 1868 that he received the appointment of architect to the Law Courts, after the great professional competition which excited so much attention at the time, both within and without the ranks of the specially architectural world. Two years previously, in 1866, he had been elected an Associate of the Royal Academy, and in 1871 was elected to its full privileges as R.A. On the death of Mr. E. M. Barry, now nearly two years ago, he succeeded that gentleman as Treasurer of the Academy and as its Professor of Architecture, although he was only once or twice spoken of in our columns as "Professor" Street, this being his own desire, as expressed in a letter to us, on the ground that he did not wish the title to stick to him. He had filled the post of Vice-President at the Institute of Architects, at the meetings of which, however, he for a long period did not take any prominent place, partly, it may be presumed, from his constant professional employment and consequent want of time, and partly, we believe we shall not be incorrect in saying, from the fact that he did not find the architectural tone and tendencies of that body altogether what he was in sympathy with. On the institution there of the new arrangements for regulating the succession to the Presidential chair, he, in fact, withdrew from the Council and from his technical right to the succession, thinking, as we also did, that the policy thus instituted was a mistake. The feeling, however, of a considerable number of members was that the architect who had confessedly attained the most eminent position in the profession should be solicited to preside over the leading professional body. After a rather strenuous skirmish between his supporters and those of the new code, which will be fresh in the memory of all concerned, and which in some of its features we think was to be deplored, he was elected by a majority, and read his opening address as President at the first meeting of the present session, which was listened to with much sympathy by one of the most crowded professional audiences ever assembled in the rooms of the Institute. Without, as we have implied, entirely sympathising with all that was done and said on the occasion of what may be called the Battle of the Chair, we were of opinion that his election was the right step to take in the main, that it was due to the remarkable position he had achieved, and that it was calculated to infuse new life into the proceedings of the Institute and give a fresh impetus to it; and many even of those who took the opposite side at the moment will feel that his death at this juncture is a heavy loss to the Institute of Architects.

The place which Mr. Street filled in connexion with the modern Gothic revival was one which was only second to that of Sir G. G. Scott. His earliest works were in Cornwall, at Biscovey and other places in the county, and Hadley Church, Essex, may also be mentioned, which was built in 1844. Buildings by him are now to be found, it may be said, all over England, as well as in Scotland and Ireland, and in many parts of the Continent. Churches from his design are in existence in Constantinople, Rome, Genoa, Lausanne, Vevay, and Mürren. One of his churches in Rome was for the American congregation there, for with Americans his reputation stood very high indeed, and another church from his designs for the American colony in Paris (no insignificant one), is just now being commenced. We append at the close of this article a list of his principal works in various localities. We may add here the following list of works by him of which illustrations will be found in various volumes of this journal:—

Memorial Church at Constantinople, second premiated design, vol. xv., pp. 162, 163.
Cathedral at Lille, second premiated design, vol. xvi., p. 91.
Church, Parsonage-house, and Schools (All Saints'), Boyne-hill, Berks, vol. xviii., p. 769.
Church of St. James-the-Less, Westminster: exterior, vol. xix., p. 411; interior, vol. xx., p. 167.
Monument to Major Hodson, Lichfield Cathedral, vol. xx., p. 45.
Law Courts, competition design, vol. xxv., pp. 113, 645.
Law Courts, plan of Court Floor, as determined for execution, vol. xxviii., p. 666.
Church, St. Peter's, Bournemouth, vol. xxviii., p. 1,027.
Law Courts, Strand front, vol. xxix., p. 947.
Reredos, Carlisle Cathedral, vol. xxxii., p. 1,011.
Church, Episcopal American, Rome, vol. xxxiv., p. 1,096.
New nave, Bristol Cathedral, vol. xxxvi., p. 14.
Bench-ends, Dunster Church, vol. xxxvi., p. 726.
Reredos, York Minster, vol. xxxviii., p. 357.

One of the first buildings by Mr. Street which was much talked of and contributed to bring his name as an architect into general repute was the church of St. James the Less, a comparatively small work, which evinced the results of much study of detail, and perhaps attracted attention the more on account of its exhibiting hints taken from the study of Italian brick architecture into which Mr. Street had gone largely some little time before, when on the tour of which the publication of his work on "Brick and Marble Architecture in Italy" was one of the results. There were not wanting, indeed, those who objected to the infusion into English church architecture of features borrowed from or suggested by Italian Gothic, certainly a more mixed and less complete style, as Mr. Street himself observed in his book, than that of Gothic north of the Alps. Mr. Street, however, held

always in theory, and carried out in practice, the idea that all forms of Gothic architecture were worth study, and contributed valuable suggestions to the architect, and it was about this time, and probably in reference to some of these criticisms that he addressed to the conductor of this journal a letter (dated January 1st, 1858), the following extract from which may be of interest as furnishing his own expression of his views on this subject:—

"No one who has examined the brickwork of Germany and Italy, would doubt that the latter is in all respects the best, whilst it is at least equally Gothic in its character. To me it appears that an architect ought to be allowed to see this without being charged with being desirous to import Italian architecture into England. We do not trouble ourselves as to the origin of anything that is really good and artistic. If it come from Venice, well; if from Lincoln, so much the better; but, at all events, and above all things, it is essential that we should trouble ourselves to be artists and not mere antiquaries. The hold which Gothic art is rapidly obtaining in this country is the result of the resolute endeavour which has been made to effect this. The new museum at Oxford is not so free from Italian influence as Mr. Parker may desire, but all of us must admit that it is singularly attractive nevertheless; and unquestionably Mr. Scott would be throwing away his best chance of securing for himself a name in the future history of art, if he allowed himself to be debarred from following in the same direction.

I believe that we, who assert that there are lessons to be learnt in Italy and all parts of France, are not one whit less really devoted to our national style than is a gentleman who would limit our foreign studies to a portion only, and that far from the best portion, of the latter country.—George Edmund Street."

It may be observed, however, that the rather marked tendency towards the employment of forms suggested by Italian Gothic, which was exhibited in the building in question, and which was a not unnatural result of his having given special study to that form of architecture shortly before, did not continue to characterise his work to any very great extent, and he soon returned to his natural predilection for the taste and genius of Northern Gothic.

The Gothic style which Mr. Street developed in his buildings was, however, unquestionably largely influenced by a preference for French rather than for English models. The solidity of character, and the sparing use of ornament, which belongs to early French Gothic, had a peculiar charm for him; and his tendency to rely upon solidity and mass in his architecture, and simplicity of detail, seems to have increased as his work went on. He appears to have more and more acted upon the theory that reticence in the employment of ornament, even if carried to the extent of producing a somewhat stern expression, was an infinitely preferable extreme to that of over-decoration. In his lectures on architecture, delivered at the Royal Academy, he decidedly and emphatically urged this view of architectural design, insisting that the very first quality required to produce good architecture was the expression of solidity and endurance in a building, and that only when that was fully considered and attained was it time to enter upon the question of ornament. All his buildings, from a very early period of his practice, exemplify this theory of the conditions of good architectural design. In all of them there is to be remarked the entire absence of anything like flimsiness or filagree, the obvious desire to produce, above all things, solid, substantial, and dignified building. With this quality in his work we are in entire sympathy. His best churches stand as monuments of solid architectural work, in which many of the finest qualities of Mediæval architecture are reproduced with a success which no other modern architect has equalled. They are more notable in this respect than even the modern Gothic of Scott, because they are less actually imitative, and present examples of reproduction of the true spirit of ancient Gothic, rather of its mere outward forms; so that in comparing them with many examples of ancient English Gothic, we might even say, in a sense, that they are essentially more Gothic than Gothic architecture itself always was. Considering how much ornament has been crowded into many modern buildings, in London more particularly, regardless of the conditions and effects of London atmosphere, the Law Courts themselves stand as a remarkable example of reticence in this respect. There can hardly be said to be any ornament that is architecturally superfluous in them; some parts of the building, indeed, rather err in the contrary direction, for which it is possible that Government ideas as to economy are, to some extent, responsible. But, on the other hand, he attached the greatest importance to one source of architectural effect,—that produced by mouldings; the source of effect, which a recent theoretical writer on architecture has generalised under the title, "the modelling of surfaces." Referring to this in his lectures, he stated, very truly, that there was hardly any more decisive distinction between good and bad architecture than that furnished by the style and character of the mouldings. Illustrating the importance of this in his own practice, we are told, on good authority, that in the case of the Law Courts alone he designed with his own hand about 3,000 different profiles of mouldings. Indeed, the personal supervision extended to the details of that immense building, was, we believe, far greater than was generally supposed, or even thought possible by the public or by his professional compeers.

The greatest architectural successes of Mr. Street, however, were in our judgment exemplified in his treatment of ordinary-sized churches rather than of the largest buildings. He had a peculiar power in rendering comparatively small churches dignified and impressive, more particularly in their interior effect. Notable instances of this are to be found in his St. Margaret's Church, at Liverpool, and in All Saints, Clifton. The former gives the impression externally of a small and unpretending church; it has no tower, only a *flèche*, which adds to this unpretending expression; but the appearance of space and dignity in the interior is surprising. All Saints, Clifton, which is really a large church, has the defect externally of hardly looking as large as it is; a defect which would perhaps be less felt if the tower and spire were completed, which are still wanting. But the interior is very fine and spacious in effect. This church was an early example of an experiment, which has occasionally been tried since, of making the main body of the church in one span, and reducing the aisles to a mere passage, securing the effect of the arcade while keeping all the congregation within it, so that no pier anywhere interposes between them and the clergy. The result was not practically as successful as it might have been, as the space between the piers and the outer wall is somewhat too cramped to allow of commodious passage, and the external treatment of the roofing of the aisle, in a series of rather low heavy gablets abutting against the main wall above the piers, is not very picturesque, though the internal effect, as a piece of effect, is remarkably good. With all drawbacks, however, it was a bold and, in its intention, a thoroughly practical idea, and one which it is to be regretted has not been more worked out as a means of rendering the Mediæval form of church more practically adapted to congregational worship.

In the treatment of revived Mediæval architecture, Mr. Street had the good fortune to enjoy one opportunity such as rarely indeed falls to the lot of a modern architect. This was the actual completion of an unfinished Mediæval cathedral, that of Bristol. We call it an unusual piece of good fortune, not only in view of the exceptional interest in such a piece of work, and the repute necessarily attaching to its successful achievement, but because in carrying out such a commission all the critical questions which may be raised as to the suitability of the revival of Gothic as a modern style may be entirely thrown on one side. The commission is to complete in its own style a building which has never been finished, and the architect can indulge fully his sentiment in favour of Gothic architecture without the slightest misgiving on the part of any one as to whether the indulgence is made at the expense of architectural logic and fitness. In carrying out the nave of Bristol Cathedral, Mr. Street obtained a real triumph in the mastery of the power of reproducing Mediæval architecture. Sir G. Scott observed, on the occasion we have before referred to (the presentation of the Gold Medal to Mr. Street), that at an early period of Mr. Street's career his acquaintance with Gothic architectural detail was so complete, that he himself had on one occasion mistaken for original Mediæval work details which had been carried out under Mr. Street's direction some time before. Such a power of assimilation found at least a perfectly legitimate opportunity in the completion of Bristol Cathedral, and except in the fresh appearance of the stone, it would really be difficult to trace any discrepancy of style or manner between the old and the new portion. We regard this as perhaps the most thoroughly successful thing which Mr. Street has accomplished.

This is hardly the time to express any definite opinion about the largest of his works,—the Law Courts,—especially as it is not yet finished, and has not had time to pass the practical test arising from continued use and occupation. Readers of the *Builder* are, however, aware that we never did regard the design, when first published, as fulfilling what might be expected from so important an architectural opportunity, though we fully recognise the fine and powerful character of a great deal of the detail. We must leave the building, however, to the verdict of Time. One thing we may say here,—that those who were present when the architect did the honours of the building to the members of the Architectural Conference, and who may have regarded Mr. Street as an architect aiming at the picturesque of architecture rather than at considerations of plan and arrangement, must have been surprised to hear, in his address on the occasion, so much evidence of the consideration which had been given to the arrangement of the internal planning and the separation and communication of the various departments as required, and the general practical and common-sense tone of the whole address; and if the building should not be successful in regard to its internal convenience, about which we have no sufficient data for a conclusion as yet, it will at any rate not have failed from any intended indifference to practical considerations on the part of its architect. The plan carried out is not the plan we were forced to take exception to when reviewing the design.

The literary portions of Mr. Street's contributions to architectural study is mainly represented by his book on "Brick and Marble Architecture in Italy," published in 1855, and "Some Account of Gothic architecture in Spain," published in 1865. The first-named book dealt with a subject which was then much less familiar to English Architects than it is now, and had a considerable influence in developing architectural taste in that direction in England, possibly a little too much so: but the book is exceedingly well done and the illustrations admirably selected and executed. The work on Spanish architecture which is much larger and more elaborate, has not attracted so much general attention as the interest of the subject and the amount of information and the number of beautiful illustrations it contains might well have acquired for it. In his preface Mr. Street said, "I feel that I have undertaken almost more than an artist like myself, always at work, has any right to suppose he can properly accomplish in the little spare time he can command. Nevertheless, I have always felt that part of the duty which every artist owes to his mother art is to study her developments wherever they may be seen, and whenever he can find the opportunity. Moreover, I believe that in this age it is only by the largest kind of study and range of observation that any artist can hope to perfect himself in so complex and difficult an art as architecture, and that it is only by studying the development of Gothic architecture in all countries that we can form a true and fair estimate of the marvellous force of the artistic impulse which wrought such wonders all over Europe in the twelfth, thirteenth, fourteenth, and fifteenth centuries." It certainly was a most spirited undertaking for so hard-working a professional man to form the design of thus illustrating what is almost an unstudied field of Gothic architecture, as a holiday task in the intervals of business; but this is not the only example that those who do most and work hardest are always those who can manage to do a little more, and certainly the book shows no signs of any undue haste, and is a most important and valuable contribution to architectural literature. Mr. Street's Royal Academy lectures, which were all printed in full in our columns, were among the best professional lectures that have been delivered at the Academy, and showed, as we observed at the time, a catholicity of tone which might not have been expected from his known strong predilections in favour of one school of architecture.

Mr. Street was probably one of the most indefatigable workers ever known in the architectural profession. It is asserted by those who knew him that there was hardly an ancient building of note or importance in Europe which he had not measured and sketched, in whole or in part. He was a splendid draughtsman, and his works were generally illustrated at the Royal Academy by perspective drawings made with his own hand, in the free style of drawing with the pen for which he was noted. We do not mention this as if it were a very peculiar

merit for an architect to illustrate his works with his own drawings,—on the contrary, we hold that there is far more of deputy draughtsmanship than there ought to be in such cases; but it is an exceptional merit, as the present general practice goes. On the occasions when Mr. Street took part in debates on architectural subjects at the Institute of Architects, his remarks were always noticeable for their plain, straightforward, and common-sense tone; he said what he had to say briefly and to the point, without any superfluous words.

From a correspondent who worked a good deal with Mr. Street, we receive some interesting particulars as to his manner of conducting his work. He had generally in his office two or three able draughtsmen (some of whom have since become distinguished architects on their own account), trained under his own eye, and accustomed to carry out what was conveyed in his own carefully-considered but rather roughly-executed pencil work. He drew and figured a plan, a section, principal elevations, with one bay of each expressed distinctly, and with some details sketched to a larger scale as guides to "inking in," and these were completed by his leading draughtsmen, or, in the simpler parts, by the juniors, under their care. He gave details also sketched to a scale of 1 in. or so to the foot with the contract drawings, but in carrying these out full size, he almost invariably altered them in some respects from the form in which they were drawn out in pencil by his draughtsmen, as he said sometimes, "not that *your* work is necessarily bad, but that it must be *mine*." A builder, restoring a church, waited for some full-sized details of mouldings, which were worked out quickly for him in the office, and brought up for Mr. Street's inspection, when, as the contractor said, "he changed them all in shape, drawing all *in* that Mr. —— had drawn *out*, and all *out* that he had drawn *in*." His rapidity was astonishing, and his command of hand for large curves for metalwork and the like, equally so; as, however quickly done, they could generally be followed with the pen implicitly. A clergyman whose church he was restoring having written for details that did not arrive, called at Cavendish-place, and came down from Mr. Street's room in an hour or so with a large roll of papers under his arm, and a triumphant smile, saying, "I have got them all!" When preparing for his usual autumnal run abroad, the quantity of work he put out of hand to be dealt with during his absence was amazing, and at all times his work might be called *ceaseless*, save when sleeping; for even when entertaining friends he went in the evening into his studio, having the doors open from the drawing-room, telling his guests, "You know where to find me." His management of mouldings was supremely good, and probably none, ancient or modern, can exceed those to be found in his carefully-studied church work. He varied his pier-cap mouldings, for instance, in most of his larger churches, drawing them within the same dimension lines on one sheet, and preserving the same character through all, so that it is only on examination in the executed work that you find how beautifully varied they are. His experience and natural shrewdness made him a valuable adviser on points of professional practice, and he had a humour, often very caustic, which one could not help sympathising with. Being asked one day by a brother architect what he advised in a case where a client (on the strength of the Westminster Palace decision against Mr. E. M. Barry) peremptorily claimed possession, as of right, of the drawings for a public building raised at his cost, he replied, "that depends on what sort of a man your client is, and whether you have any expectation of further commissions from him."

As to construction, he was more accustomed to trust to massiveness than to science for security. In restoration, no man could be more conscientious; never disturbing what could be well retained, never altering what had to be taken down and rebuilt, or departing from the spirit of his original where the work was necessarily new, and *specifying* old stone-work not to have the lichens disturbed.

Besides his appointment as architect to the diocese of Oxford (which was bestowed on him through the influence of Bishop Wilberforce, with whom he maintained a warm friendship, which was only closed by the death of the Bishop), Mr. Street also subsequently filled the same post in the dioceses of York, Ripon, and Winchester. He was a Fellow of the Society of Antiquaries, and a member of the Imperial and Royal Academy of Arts at Vienna, and a Knight of the Legion of Honour.

Mr. Street's funeral was to have taken place on this Friday, the 23rd inst., at Holmbury, near Dorking, where he had built for himself the beginnings of an unfinished country house, and where he had built also a church at his own expense. Everything had been arranged, we understand, under the direction of his executor, Mr. Wells, the well-known Royal Academician, but the Dean of Westminster has since sanctioned the interment of his remains in Westminster Abbey, and the funeral will take place on Thursday next, the 29th inst.

In thus briefly reviewing his life and work, we feel that this is not the time to enter into any consideration how far Mr. Street's views and practice as to the all-sufficiency of a revival of Mediæval architecture were or were not in accordance with the genuine requirements of modern architecture. That we have our own views on that subject, and that they are not entirely in accordance with his, our readers will will have no difficulty in understanding. But Mr. Street started in his professional life under the auspices of an enthusiasm for revived Gothic, and it is from that standpoint, and in reference to his own ideal, that his work must, in one sense at least, be judged. His merit, and his claim to the position that he earned, is that he spared no pains in perfecting his own ideal of architecture, and that whatever he did, he did with all his might.*

The following is a list of some of Mr. Street's works:—

Churches.

Kingstone, Dorset.
St. Mary, Holmbury.
Boyne-hill Church and Almshouses.
St. John the Divine, Kennington.
St. James the Less, Garden-street.
St. Mary Magdalene, Paddington.
St. Saviour's, Eastbourne.
St. John's, Torquay.
Long Ditton Church.
American Church in Rome.
English Church in Rome (now building).
English Churches in Genoa, Constantinople, Lausanne, Mürren, Vevay.
All Saints', Clifton.
Toddington.
Garrison Chapel, Portsmouth.
Eylingdales.
New Pitaligo.
St. Margaret's, Liverpool.
Tinsley.
Muirhead.
St. Mary, Southampton.
Speenhamland.
Church for Americans Paris, now just being begun.
Helperthorpe, Kirby, Grindalythe, Thixendale, Fimber, and many others, for Sir Tatton Sykes.
Buterolt, Ellon, Llandulas, Swinton, Eltham, Milarow, &c.
St. Philip and St. James, Oxford.
Summertown, Oxford.

The most noteworthy Ecclesiastical Buildings.

Bristol Cathedral, nave and western towers.
Dublin, Christ Church Cathedral and Synod House.

Some Restorations.

Bere Regis, Thornhill, Melksham.
York Minster, south transept.
Works in Carlisle Cathedral and Fratry.
St. Peter's, Bournemouth.
Works at Salisbury Cathedral.
High Wycombe Church.
St. Peter's Mancroft, Norwich.
Hythe Church, South Hayling, Kettering, Tettenhall, Henbury, Luton.
Jesus College, Oxford.
St. Luke's, Lower Norwood.
Wheatley, Welshpool, Guildsfield, East Harptrees.
Wellington Barracks Chapel.
Kirby Underdale, Kirby Wiske, Kirkby Overblow, Sledmere, Charleywood.
St. George's, Bloomsbury.
Farlington, Tamworth, Thirsk, Barnsley, Bignor, Hagley, Hadley, Claybrooke, Colmere, Clun, Great Duffield, Kildare Cathedral, Monmouth, Oswestry.
St. Martin's, Leicester; St. Margaret's, Leicester.
Yatton, Dunster, Thurgoland, Backwell, Weatherthorpe, Speen, Monkland, Gresford, Aston Abbott's.
St. Michael's, Penkivel, &c.

Buildings other than Churches.

Theological College, Cuddesdon; St. Margaret's Convent, East Grinstead.
Vicarages:— Kingstone, Dorset; East Heslerton; Chapel Allerton; Melksham, &c.
Rectories:—Wigan, &c.
Duncecht House and Chapel.
Haddo House.
Grwych Castle, private chapel.
Luton Hoo, private chapel.
Longmead, Bishopstoke.
House in Cadogan-square.
Holmdale (near Dorking).
School buildings at Uppingham, Marlborough, and Bloxham.
Master's house at Winchester.
Schools at Wigan, Eaton Town, and Wantage.
Home at Wantage.
Dundee House of Mercy.
Parsonage, Erle Stoke.
Many other schools, houses, and vicarages.
Royal Courts of Justice.

* A portrait of the subject of our memoir will be found in vol. xxvii. (1869) of the *Builder*, p. 703.

THE LATE MR. DECIMUS BURTON.

We regret to record the death of an old and eminent member of the architectural profession, Mr. Decimus Burton, F.R.S., F.S.A., which took place on the 14th instant, at his residence, No. 1, Gloucester Houses, at the mature age of eighty-one.

Mr. Burton, although he had been practically for fifteen years past a retired member of the profession, and owing to his advanced age, had of late years been little seen amongst his professional brethren, was well known to many, and was, by all who had the advantage and pleasure of meeting or associating with him, respected as a straightforward and high-principled professional man, and in society as a cultivated gentleman.

Born in the year 1800, he received a good practical education in the office of his father, Mr. James Burton, who was well known sixty years ago as one of the most active and enterprising of London builders, and afterwards as the founder of the town of St. Leonards-on-Sea. Mr. D. Burton completed his professional education in the office of Mr. George Maddox.

Mr. Burton received, when quite a young man, important commissions, and found himself, before he had completed his twenty-fourth year, in the full tide of professional work. He was scarcely twenty-three when he was commissioned by Mr. Horner to build the Colosseum in the Regent's Park, a building which, although as a panorama and a place of entertainment a failure, was regarded as involving the architectural feat of throwing an unsupported dome, a few feet larger than that of St. Paul's over the whole building,—a success. It has since been pulled down, and its place, which knows it no more, has been made the basis of a more profitable investment in the shape of the terrace of private residences forming Cambridge-gate.

Mr. Burton was in the year 1825 commissioned by the Government to carry out the Hyde Park improvements, which comprised the laying out of the roads, and the design and erection of the façade and triumphal arch at Hyde Park-corner.

The arch was intended to form the principal entrance to Buckingham Palace; but the alterations subsequently effected in the approaches have left the arch in what appears to be a comparatively unmeaning, although a still effective, position.

It is the frequent fate of architects to undergo many and sore disappointments in the alteration or incomplete fulfilment, and sometimes the mutilation, of their cherished designs. One of the hardest trials Mr. Decimus Burton had to bear was the disfigurement of his arch by the imposition of a colossal equestrian statue of the Duke of Wellington, and that too, placed, contrary to all classical precedent, across, instead of parallel with, the roadway spanned by the arch.

In vain did Mr. Burton protest against the disfigurement of his beautiful edifice, urging upon the authorities that the arch, if it was to be treated as a pedestal, was not properly proportioned to the statue, or, having regard to the character of the latter, in harmony with it; that the group originally designed for the surmount was a *quadriga*, the car, with its four horses, forming a pyramidal group proportioned to the whole structure. In vain did Viscount Canning write in his official capacity from the Office of Woods and Forests to the then Duke of Rutland, the chairman of the committee of subscribers to the Wellington Memorial, on the 15th of May, 1846,—"It is my duty to state to your Grace that the remonstrances which reach her Majesty's Government against the proposed appropriation of the arch are so many and so strong; the representations of its architect, Mr. Burton, in the same sense, are so earnest; and the opinion of every other eminent architect, artist, or competent authority who has been consulted on the subject is so decided, that her Majesty's Government feel called upon, not only to make a final effort to induce the subscribers to reconsider the subject of placing the statue on the site at present proposed, but to do all that lies in their power to facilitate a change in the design." And he proceeded to propose that the statue should be erected upon a suitable pedestal of its own elsewhere (other sites being suggested), Parliament defraying any increased cost of the change. All was to no purpose; the arch had, so to speak, been engaged to the statue seven years before by Lord Melbourne, the Minister of the day, and the alliance was ratified by his successor: subscribers had sub-

scribed their money, and the statue had been bought on the faith of its being engaged to Mr. Burton's unhappy arch, and the customs of a strictly constitutional country did not permit of the engagement being repudiated. The opinion as to the unfortunate effect of the result, in the minds of those who had any sense of the architectural and artistic fitness of things, is well indicated in an anecdote which, if not true, is at least *bon trovato*, of a French general officer, who, after contemplating the arch and statue for some time, was overheard to say to himself, "Nous sommes vengés!" It may be added that any idea of removing the statue from its unsuitable position would have been rendered impossible during the life-time of the Duke of Wellington by his own strong opposition to any such proposal. The duke's sense of artistic propriety was not strong, and his feeling probably was that where the nation had decreed to place a statue in honour of him, there it ought to remain. Of Mr. Burton's own strong feeling in the matter, he gave a remarkable practical proof in the fact that for many years afterwards, if we are rightly informed, he made provision for the payment to the nation, out of his personal estate, of 2,000*l*., if they would accede to the removal of the statue from its unsuitable position; but seeing little prospect of his hope being fulfilled during the present century, he before his death withdrew the legacy, cherishing, however, to his dying day the hope that the nation, when it should return to, or develop, its artistic senses, would remove the Wellington statue elsewhere, planting it on a fitting pedestal of its own, and carry out the *quadriga* and bas-reliefs to complete the work according to his original design. We know not whether it is of any use still to express the hope that this may be done eventually, in justice to a man who held a distinguished place among English architects in his own day, and in the furtherance of architectural art and the removal of an absurdity which is still the subject of constant satire. Much cannot, however, be hoped in a country in which it has just been considered suitable to adorn the site of the Egyptian "needle" with a couple of modern sphinxes placed, contrary to all architectural precedent and meaning, with their noses to the central object and their posteriors displayed to the spectators approaching in either direction along the only route of approach.

Greek architecture was in Mr. Burton's time the order (or the "Orders") of the day, and formed his model mainly, though the Constitution Hill arch is, of course, a Roman type of erection. He did not, however, in his buildings for practical purposes, affect massive temple-like structures with heavy portices and light-obscuring columns, but gave to his works graceful and refined elevations, and provided ample openings for light and air; and though such provision be nothing more than the common-sense of architecture, he must be given the credit of having attended to this at a period when many architects ignored it; and we consider that the criticisms which have been elsewhere made as to the want of practical character in his domestic buildings, are, considering all the circumstances and the taste of the time in which he worked, unjust and uncalled for.

Mr. Burton's public works would probably have been far more numerous and important had he not been early tempted by the offer of Mr. John Ward, of Tunbridge Wells, from whom he accepted a special retainer to lay out for him the Calverley Park Estate. This engagement occupied most of his time for some years; and this break, coupled perhaps with his disinclination to work much for the representatives of a public which had already suffered one of his best architectural works to be marred, tended to divert him into the quieter field of house-building for noblemen and gentlemen, in which he much distinguished himself. The mansions, villas, and cottages designed by him were numerous, and were characterised by good internal arrangement combined with external simplicity and purity of style.

Mr. Burton had for several years before his death retired from the active pursuit of his profession, and in 1869 finally relinquished it. He was much attached to St. Leonards-on-Sea, where he had a pleasant bachelor's cottage. Latterly he had been in failing health for some months, but it was not until some seven weeks before his death that his friends had special cause for anxiety. His physical powers then gradually failed, and he breathed his last on the 14th of December, without pain or suffering; a quiet decease which seemed in happy accordance with a life during which he had been known as amiable, considerate, and gentle to all.

Mr. Burton made, when travelling was not so common as it is now, a lengthened tour in Italy and Greece, visiting and carefully studying the ancient buildings and remains in those classic regions; and at a later date he made a visit to Canada and the United States. He was a Fellow of the Royal Society and of other learned bodies, and was one of the earliest Fellows of the Royal Institute of British Architects, of which also he had been a vice-president.

The death of Mr. Burton occurring almost simultaneously with that of Mr. Street brings into significant contrast the characteristics of two successive epochs of modern English architecture, and the extraordinary rapidity with which the pendulum of architectural taste in this country has swung from one extreme to another. Mr. Burton's long life has only just terminated, and yet the method of architecture which he practised during a long professional career is already like a vanished dream. Of the men who are most prominently and strenuously engaged in architectural practice at this moment, there are probably few who would not be disposed to regard Mr. Burton's architecture as hardly worth recollecting; Mr. Street himself would probably have scouted all reference to it, as exemplifying the work of a period of architectural imbecility. There is no pretence for saying that Mr. Burton, as a leading representative of his period, evinced anything like that extraordinary enthusiasm, force of character, and power in dealing with architecture from his own point of view, which have made Mr. Street's career such a remarkable one. But if we consider how highly in his own day he was esteemed, and how completely right his view of architectural art was considered to be by a large following of clients, many of them men of high education and culture, it certainly may be said that his career suggests matter for serious reflection, on the part of those who, with perhaps more enthusiasm and genius, are now nevertheless carrying out other revivals of past styles of architecture, with, in many cases, much less consideration for the really practical objects of architecture than he evinced. Are they sure that in the lapse of another generation of men their own favourite revived phase of architecture may not appear as *passé* to their successors as Burton's architecture now appears to some of them?

Dropping this consideration as one not unworthy of being followed out to practical ends, we conclude by appending a list of Mr. Decimus Burton's principal executed works:—

1822-24. Cheshunt, residence, additions, &c.—Mr. Joseph S. Jessopp.
1823-33. Brighton, villa.—Mr. H. Fauntleroy.
1828-29. Holyrood, mansion, &c.—Mr. John Ward.
1828-52. Tunbridge Wells, Calverley improvements.—Mr. John Ward.
1822-24. Regent's Park, Grove House and offices.—Mr. G. B. Greenhough.
1823-27. Regent's Park, the Colosseum.—Mr. Thos. Horner.
1822-25. Leatherhead, Elm Bank, additions.—Captain Stanley Clarke.
1822-48. Pall-mall East, house and warerooms.—Messrs. Hebbert & Co.
1823-25. Baston House, Kent, additions.—Mr. Samuel N. Ward.
1824-44. Molesey, Surrey, additions; Stokes Bay, Marine Villa.—Rt. Hon. J. W. Croker.
1826-27. Pall-mall East, houses and shops.—Sir H. F. Cooke.
1827. Mitchells, Tunbridge Wells, villa.—Mr. C. H. Okey, Mr. John Carruthers.
1826. Abersychan Iron Works, the designs.—The Company.
1827. Liverpool, mansion, the designs.—Mr. Joseph B. Yates.
1826-41. Zoological Society, London, buildings and gardens.—The Society.
1829-30 Tunbridge Wells, Great Culverden House.—Mr. J. Jeddere Fisher.
1829. Bath, Public Baths Improvement, report.—Corporation.
1828-30. Tunbridge Wells, Calverley Park, villas, &c., designs.—Messrs. Bramah.
1825-46. Hyde Park, general improvements; lodges at Cumberland, Grosvenor, Chesterfield, Hyde Park-corner (façade), and Prince of Wales Gates; archway on Constitution-hill; improvements and lodge in Birdcage Walk; guards' store and Westminster Mews; the railing and piers, Buckingham Palace.—H.M. Commissioners of Woods, Works, &c.
1828-31. Carlton House-terrace, mansion.—Lord de Clifford.
1828-32. Carlton House-terrace, mansion.—Lord Stuart de Rothesay.
1829. Beckenham, villa residence.—Mr. B. Oakley.
1827. Harrow, two houses.—General Macgregor.
1828-31. London, Royal Naval Club.—The Club.
1827-30. London, Athenæum Club House.—The Club.
1830-32. London, warehouse, &c.—Messrs. Gilpin & Co.
1832-33. Regent's Park, Holford House.—Mr. James Holford.
1831-33. London, Charing-cross Hospital.—The Governors.
1831-32. Sevenoaks, Rectory House.—Rev. Thomas Curteis.
1831-32. Pain's Hill, Surrey, additions, &c.—Mr. W. H. Cooper.
1830-34. Clifford's Inn, improvements.—The Society.
1830. Park Hatch, Surrey, conservatory, &c.—Mr. Joseph Goodman.
1831. Stock Grove, Beds, additions.—Col. Hanmer.
1833. Holland House, restorations.—Lord Holland.
1830. Pall Mall, alterations of residence.—Mr. John Kirkland.
1829-31. Mabledon, Kent.—Mr. John Deacon.
1831-32. Ramsgate, East Cliff House, additions, &c.—Sir Moses Montefiore.
1829-34. Southborough, Kent, church.—Mr. John Deacon.
1830-31. St. Martin's Place.—Royal Society of Literature.
1832-33.—Bentham Hill, Kent, house and offices.—Mr. Arthur Pott.
1833. Worth Park, Sussex, additions, &c.—Mr. Montefiore.
1830-48. Chatsworth, palm-house, home farm, &c.; Chiswick, lodges and gates; alterations, &c., at Grove House; Corney House, Sutton Court; Devonshire House, portico, hall, staircase.—Duke of Devonshire.
1831-32. Penshurst, Kent, the Grove.—Mr. Allnatt.
1831-33. Bury Hill, Surrey, additions, &c.—Mr. Charles Barclay.
1829-30. Pembury, Kent, Spring Grove.—Mr. A. B. Belcher.
1830-31. Riverhead, Kent, church.—The Trustees.
1831-32. Whitehall Gardens, additions.—Mr. Cuthbert Ellison.
1832-37. Regent's Park, St. Dunstan's Villa.—Marquis of Hertford.
1831-34. Combe Wood, house and offices.—Mr. W. O. Hunt.
1835-38. Vere, Somersetshire, additions, &c.—Sir W. Medycott, bart.
1830-31. Regent's Park, St. John's Lodge, additions, &c.—Sir J. L. Goldsmid, bart.
1831-38. Broomhill, Kent, house and offices.—Mr. David Salomon.
1831-38. Burswood, house and offices.—Mr David Salomon.
1834-37. Oaklands, Sussex, house and offices.—Mr. Hercules Sharpe.
1838-40. Blackheath, Kent, house and offices.—Mr. James Traill.
1836-38. Blackhurst, Kent, house and offices.—Mr. Ford Wilson.
1845. Bellevue, Tunbridge Wells, house, &c.—Mr. Aretas Akers.
1838-44. The Hooke, Sussex, additions, &c.—Mr. R. W. Blencowe.
1858-60. Bineham, Sussex, mansion and offices.—Mr. John Blencowe.
1839-41. Woodhay, Surrey, additions, &c.—Mr. Wm. Brown.
1847-48. Bury Hill, observatory.—Mr. A. K. Barclay.
1845-46. Harrow, boarding-house.—The Committee.
1855-56. Hyams, Surrey, additions and alterations.—Hon. Mr. Seymour Bathurst.
1855-56. Seanowe, Norfolk, additions and alterations.—Trustees under the Court of Chancery.
1841-45. Stapleton Palace, near Bristol, additions and alterations.—Ecclesiastical Commissioners of England.
1834-35. Glevering Hall, Suffolk, additions, &c.—Mr. A. Archdeckon.
1854-35. Derby House, near Liverpool, building estate.—Mr. R. A. Barton.
1835-40. Eastbourne, building estate, a villa.—Earl of Burlington.
1839-40. Belgrave-square, additions.—Earl of Burlington.
1835-37. Kennington, near Canterbury, additions to residence.—Dr. Carter.
1835-36. Hollands, near Tunbridge Wells, villa.—Rev. H. Cholmondeley.
1838-39. Harrow, Middlesex, residence.—Rev. J. W. Celenso.
1838-39. Club Chambers, Regent street.—The Association.
1837-39. Trinity Church, Eastbourne.—The Committee.
1834-35. Great Brick Hill, rectory house.—Rev. H. Foulis.
1838-40. Flimwell, Kent, church.—The Trustees.
1837-38. Putney Park, additions to mansion.—Mr. B. Hutton, M.P.
1839-50. Grimstone Park, Yorkshire, mansion and offices.—Lord Howden.
1839-40. Kelvinside, near Glasgow, building estate.—Mr. M. Montgomerie.
1835-36. Grosvenor-street, additions to residence.—Duchess of Roxburgh and Col. O'Reilly.
1839-40. Greenstead, Essex, parsonage.—Rev. P. W. Ray.
1830. Wolstone, Bucks, parsonage.—Rev. Dr. Butler.
1835-40. Coghurst, Sussex, mansion and offices.—Mr. Musgrave Brisco.
1839-61. Stanwick Park, Yorkshire, additions, &c.; Byon, river terrace, ornamental dairy, &c.—Lord Prudhoe, afterwards Duke of Northumberland.
1844. Stokes Bay, villa.—Lord Ashburton.
1843-50. Queenstown, Cove of Cork, improvements, sea-wall.—Viscount Middleton.
1840-59. Royal Botanic Gardens, Regent's Park.—The Society.
1835-43. Fleetwood, new town, church, hotel, lighthouse, &c.—Sir H. Fleetwood, bart.
1845-59. Bournemouth, new town.—Sir G. T. Gervis, bart., and Trustees.
1836-38. Goring, Sussex, parish church.—Mr. David Lyon.
1843. Folkestone, building estate.—Earl of Radnor.
1841-60. Union Club, London, additions, &c.—The Club.
1842-60. United Service Club, London, additions, &c.—The Club.
1842-52. Junior United Service Club, London, alterations.—The Club.
1853-58. Bearswood, Berks, additions, alterations, &c.—Mr. J. Walter, M.P.
1834-49. Dublin, Phœnix Park Improvements.—Her Majesty's Commissioners of Woods, &c.
1844-66. Kew Royal Botanic Gardens' Improvements, Palm House, Winter Garden, &c.—Her Majesty's Commissioners of Woods and Works.
1840-49. Paris, Ambassador's House, improvements, &c.—Her Majesty's Commissioners of Works, &c.
1852-55. Bolmore, Sussex, additions, &c.—Miss Dealtry.
1855-57. East Retford, Free Grammar Schools.—The Trustees.
1841-42. 18, Hyde Park Gardens, residence.—Mr. Drummond.

1841-43. Hayden Hill, Bushey, Herts.—Mr. T. G. Fournereau.
1845-46. Hill of Howth, building estate.—Earl of Howth.
1845-46. Harrow, head master's house.—The Governors.
1842-43. Hemingford, Huntingdonshire, house and offices.—Rev. J. Linton.
1849-53. Church, Launceston, restoration.—Church Building Society.
1845-47. Whipp's Cross, house and offices.—Mr. J. Masterman, jun.
1849-51. Bradford Peverell, Dorset, church.—Mr. H. N. Middleton.
1850-54. Bradford Peverell, house and offices.—Mr. H. N. Middleton
1853-54. Great Stanhope-street, additions, &c.—Mr. A. Mitchell.
1857-58. Finchampstead, Berks, house and offices.—Rev. T. Mozley.
1852-54. Oriental Club, London, additions, &c.—The Club.
1853-54. Calstock, Cornwall, Rectory House.—Rev. C. L. Pemberton.

ABOUT THEATRES AND CHURCHES.

THE terrible catastrophe at Vienna impels us once again to raise the voice of warning as to our own negligence,—we fear, increasing negligence,—in the provision of due exits from our public buildings. We did so, our readers may remember, on the occasion of the last general election; and very serious injuries were reported, within a few days after our warning, as occurring to well-known individuals, in consequence of the absence of proper arrangements for this purpose. We have now the accounts, daily increasing in the estimates which they give of the loss of life by this last fatal occurrence, of which it may certainly be said that if fire slew its units, panic slew its hundreds. The slaughter effected is as much as that of a great battle; and the proportion of deaths to wounds very far more than in any battle of modern times. But we cannot but remember that even this frightful slaughter is far less than that which took place in a church in South America. And while it is well that a thorough investigation should be made of the condition of our theatres, both as to construction and as to the readiness for use of all those appliances which a wise forethought has provided for service in case of fire, we must reiterate the advice to take some similar precautions in the case of our churches. Year after year they become more numerous, as well as more densely filled. Year after year are they more luxuriously warmed, more dazzlingly lighted, and, in but too many cases, so carefully guarded against draught that the wise architectural rules of the old Roman and Gothic builders are wholly disregarded, and ancient doors are even walled up without any substitute being provided. In new churches the same utter disregard of the first requisite of a public building, provision for the safety of its inmates, is to be found. We called attention, as yet without effect, to one example, that of a church built within the last few years in a country town with many elements of architectural excellence and beauty; served by devoted clergy, filled by numerous and munificent congregations, and yet in which the main exit at the north-west corner of the building is marked by the combination of almost every fault that can deform this part of a public edifice,—doors opening inwards, two doors opening into one vestibule, from which there is only one door of exit, and steps downwards, both into the vestibule and from the outer door of the church. In addition to this accident-trap there are only a north door of moderate size, and two or three very small doors used for the purposes of the clergy and attendants of the church. There can be no doubt that, in the event of a panic, from which no gas-lighted building is safe, the consequences here would be most disastrous; and yet benevolent and well-meaning people are content to go on raising funds for the adornment of the church, paying no heed to the loud warnings which are given to them, by such an occurrence as that at Vienna, of its utter unsafety. Is it necessary now to recall attention to the fact how apt a source of panic, and even of disaster, is a copious illumination by gas?

One of our correspondents discusses, in a thoughtful manner, the necessity for providing against panic, as well as against danger. The method which he suggests is to provide tiers of open galleries outside the main walls of the building, each gallery being of sufficient area to contain all the occupants of that stage of the theatre. Broad staircases, apparently intended to be external, would descend from these galleries into the street. The idea is not without merit. But the large addition that it would make to the non-paying area of the ground covered by the theatre would prove a very strong obstacle to the adoption of the plan.

But why are we so slow to follow in principle the wise, and we may almost say perfect, arrangements of those great builders from whom we have derived almost all that we know of architectural theory? In Rome, especially in the Imperial times, public amusement was one of the chief subjects of the study of the statesman. The call which he made on the architect to provide a stage and an auditorium for great exhibitions was responded to by the very genius of architecture herself. Let the student climb the deserted steps of the great amphitheatres at Capua, at Pozzuoli, at Pompeii, or on other Italian sites, and ask himself what arrangements can be more perfect. It is, no doubt, true that the requirements of the modern theatre are necessarily different from those of either the amphitheatres or the theatres of Imperial times. Of that class of building which suits the exigencies of modern opera or drama we have no classical example, and that for the good reason that the method of the performances is entirely different from that which prevailed on the Greek or the Roman stage. Palladio, indeed, built a theatre at Venice, and Serlio built one at Vicenza, according to the principles of Vitruvius; and towards the close of his life the former architect built the Teatro Olympico at Vicenza, which still exists, being at once the finest and the best of its race as a classical theatre in modern Europe. With these exceptions we cannot trace one existing theatre, or those which they represent, further back than the first quarter of the seventeenth century. The theatre of the Hôtel de Bourgoyne was famous in Paris about 1620, and was rebuilt, with tiers of boxes, in 1645. The theatre of the Palais Royal was built by Richelieu in 1639, and the horseshoe form was first given to the auditorium by Fontana, in 1675, in a theatre which he built in Rome.

The consideration which led modern architects to depart from the admirable simplicity and beauty of the amphitheatrical arrangement was, that in the modern drama, which is not intoned, but spoken, and in which prose is for the most part used instead of metrical verse, it is necessary to bring the furthest auditors within range of the audibility of the human voice, and even of the female voice. Again, with the disuse of the strongly-accentuated mask, and the other appliances by which the Greek drama was able to affect spectators at a considerable distance from the stage, it became necessary to bring the most distant spectators within such a distance of the actors as to allow the play of their features to be distinctly visible. In the common Punch's show of our streets we find a survival of the classic drama. It is evident that a human Punch, furnished with an appropriate mask, might perform his well-known pranks, aided by his instrumental squeak, on a stage in such a manner as to tell on an immense audience. On the other hand, and at the very opposite extremity of the scale, we can cite the Policinello Theatre at Naples, which we conceive to be probably the smallest public permanent theatre in Europe. Stalls, boxes, pit, are all of the most miniature description; and the largest possible audience is so small, that the performance is repeated twice in the day. But in this wonderful little cockleshell, the art of pantomime has reached its very acme. The pantomime of the principal performer, Policinello, or Punch, who wears a loose white linen blouse and trousers, and a mask over his forehead and the upper part of his face, is so magical as to affect the spectators to the highest degree, so that the little den, fetid as it becomes in the course of the performance, is,—or at least was in the Bourbon days,—a favourite resort of the royalty as well as the nobility of the Two Sicilies. The play of features on the exposed part of the face of the actor was such as it would be idle to attempt to describe. Here the connexion between a very small theatre and a perfect actor, of his class, was intimate and essential.

The limit of distance at which the practice of the theatrical architect has usually halted in Europe has been from 50 ft. to 70 ft. The theatre at Marseilles has a distance of 76 ft., and that of Versailles of 77 ft., from the curtain to the back of the boxes; but the noble theatre at Bordeaux has only 70 ft., which is also the distance in our own theatre of Drury Lane. This regards dramatic theatres. For lyric theatres the range is wider, reaching up to 100 ft. in the San Carlo Opera-house at Naples, and to 105 ft. in La Scala Theatre at Milan. Taking, then, this extreme range of, say, 66 ft. to 100 ft. for the two kinds of theatres, the arrangement of boxes tier above tier becomes a necessity,—the height being only limited by the angle at which the performers become so foreshortened as to be out of true vision.

Thus far the architecture of the modern theatre has been a natural growth; whether it provides three tiers of boxes, as at Versailles, or seven, as at La Scala. But here comes in a point which, so far as we are aware, has never yet been adequately grasped by any architect or architectural writer.

If we look at the sections of any modern theatre, the building divides itself into two main parts of almost equal dimensions, to which all the other arrangements are subsidiary. These are, of course, the stage and the auditorium. But if we look at the section of an amphitheatre we see three equally important parts,—of which the stage, indeed, is generally the smallest. But the provision for the exit and entrance of the people is as conspicuous as, and occupies as much if not more space than, the auditorium itself. Thus, in a building as vast as the Colosseum, the time of from 100 to 140 seconds was sufficient to empty it altogether, and as crush was impossible, panic was deprived of its terror.

Whether this wise and beneficient arrangement sprang directly from the brain of the great architects, or to some extent wrought itself out from the other conditions of the amphitheatre, it is unnecessary now to discuss. What is important is, first the fact, and secondly the truth, that the precaution has been absolutely neglected in the modern theatres. We do not say that care has not been given to entrances, staircases, corridors, or the like. But we say that that balanced compensation for thickening crowds which is present in all the amphitheatres of which we have any knowledge is wholly absent in the modern theatre.

The reader will see at once what we mean when he reflects that the amphitheatre presents the frustum of an inverted cone, enclosed in a tower. The modern theatre presents two concentric towers,—or rather one tower, with interior landings, divisions, and staircases. In the amphitheatre the largest number of persons that could be contained in equal vertical heights was that which sat on the topmost six or seven steps of the ring. For these an external corridor, separated by a wall thickening as it descended from the auditorium, gave ample space for circulation. Rapidly as the people could pour out from the numerous gangways between the *cunei*, there was in every instance room for them all in their own corridor. But in the corridor below, answering to the next eight or ten steps of the conch, there was not only the width of the top corridor, but the additional width of 10 ft. or 12 ft. due to the contraction of the cone. And thus, however fast the people poured from above, even had the flow been like that of water itself, there was no heading back, no stoppage. The only thing necessary to care for to prevent this was equally to increase the number of staircases from story to story. The corridors, which of course, became not widened so much as multiplied, as they descended, were each always ample to accommodate not only their own population, but that of all the superior zones.

Of this admirable self-compensation for thickening crowds there is not a vestige in the modern theatre. We do not, of course, pretend to say that in planning corridors and staircases the architect has taken no heed of the number of persons that they were to serve. But there is no evidence in any section of a great theatre with which we are acquainted, from La Scala to the New Opera-house at Paris, of the presence of the idea that it might be necessary to prevent the heading back of a madly precipitant crowd. On the contrary, the outer wall containing the corridor is as vertical as the inner wall. Serial escape is thus alone possible, unless the accommodation be immensely in excess on the top story, in which, it must be remembered, the position of the gallery in most theatres accumulates the class of people likely most madly to suffer from panic, and that in the most overpowering numbers. We cannot but conclude that modern theatre-builders, from Fontana downwards, have neglected one of the most subtle and important rules acted on by the Roman builders.

It may be said that to carry out the dictates of absolute prudence in this case would involve

the giving a conical or pyramidal form to the outside of the building. To the structural proportion of auditorium and exit it would no doubt give such a form. If you wish to produce the economy of room, which was given by the inverted cone in the tower, it can only be done by the use under modern arrangements of the upright cone without the tower. But there is no reason why the outer walls of the building should be conical, or, rather, stepped; although there is reason for the successive widening of the corridors. Rooms available for many purposes might be built over the receding galleries. If the great principle of absolute safety from crowding were once accepted, other details would fall into place.

We say nothing here of those great *salles des pas perdus*, and the like, which are daily assuming more importance in modern theatres, forming almost a third part of the structure. All with which we are now concerned is absolute safety of exit. We have seen how that was assured by the Roman builders. We have seen how it has been lost sight of, at all events as a self-regulating feature of the building, by their successors. And we commend the consideration of the subject to those whom it so closely concerns. In a building on one plane, all that is demanded for safety is an adequate supply of doors. In a building on many planes, the exigencies of each plane become the more serious, the more stories rise above it from the ground.

Nor is it less important to provide for the structural separation of auditorium and exit. This ought to be such that while free egress from the one to the other is practicable, there should be a substantial barrier against fire. This the use of sheet-iron doors renders easily practicable. In the amphitheatre this security was attained by the small size of the gangways, and the thickness of the wall which was required for the support of the stepped seats, increasing as that did in thickness with every row. No doors appear to have been fixed to these gangways. Nor were they requisite. Curtains were no doubt hung over the apertures into the corridor, which would answer the only end for which doors would be otherwise needed, the prevention of draught. And we have personally little doubt that the thick-padded curtain which usually falls over the ever-open wickets in the doors of the great Italian churches, is a survival of the kind of curtain thus used in the Roman theatres.

If we contrast this simple and effective separation of the auditorium and the exit galleries in the Roman theatres, with the flimsy backs that divide the boxes of our opera-houses and theatres from the corridors which give access to them, we cannot fail to be struck with the difference in the matter of safety, in the event of fire. Of all instances that occur to memory, that of La Scala, at Milan, is the most reprehensible in this respect. We cannot, indeed, speak positively as to the structure of the back of the boxes here, although long habit of attendance in our own box at the San Carlo Theatre, at Naples, induces us to think that no true structural division exists at Milan. But to the greater number of the boxes in La Scala a small *salon* or cabinet is attached, not immediately, but on the opposite side of the passage. Thus the outer case of the auditorium is not so much the horse-shoe form of the back of the boxes, as the rectangular form of the back of the *salons*; the corridor, or passage, forming a mere pathway between the two rooms. Thus, in case of any great fiery catastrophe, such as an explosion of gas, or a storm of flame such as enwrapped the Vienna Theatre, the corridor, or mode of escape, would be involved in the same destruction as the auditorium; and escape would be rendered impossible. We think that after this essential requisite for the safety of a theatre has thus plainly been pointed out, any architect who neglects to provide for it will undergo the gravest responsibility. But further than that, we think there should be legislative interference to prevent the construction or use of buildings intended for public occupation without due heed to the principle of safety.

Of course it would be competent to the architect who desired to prevent the widening or multiplication of corridors with each tier of descent to accomplish the same object by supplying each corridor with its own pair or two pairs of staircases, independent of those below. But in this case no access into these staircases should be allowed from any lower corridor. Each set of stairs should be rigidly restricted to the service of its own floor. In the amphitheatre the stairs are in proportion to the width or number of the parallel corridors. It might, perhaps, prove more accordant with the turret form of the auditorium to multiply external staircases, rather than to multiply concentric corridors, each furnished with its own means of ascent or descent. That is a matter of detail which will form a feature in any future designs, according to the genius of the architect. We refer to it as showing a mode in which the great aim of safety can be carried out, without attempting to put any limit on the freedom of design. What is essential, in our opinion absolutely essential, is this.

While entrance to a church, theatre, or other public building, may be conveniently allowed by the use of an appropriate number of small doors, each admitting only one or two persons at a time, it is essential to safety that exit should be afforded by an adequate number of large doors, opening outwards, and all of equal width with the aisles or corridors that lead to them. The stately western doors of some of the great cathedrals were not matter of pomp alone. In fact, the occasions on which they were so used must have been rare, as the clergy usually entered in procession from the chapter-house, or some room for assembly on the south of the church, through a south door west of the chancel. But not only were these large doors (never obstructed by those inner vestibule and baize-covered doors now required to guard our congregations from the west wind) noble architectural features of the building, but they possessed a special value in any case of emergency or alarm. By throwing wide open, as is generally done at the close of a solemn service on a *festa*, all the doors of a cathedral, exit is afforded for the worshippers in a very brief space of time. Nor shall we be entitled to be regarded as a people whose boasted regard for human life is strong enough to induce us to take a little trouble when danger is not visibly before us, if we do not take stringest measures to ensure such a visitation of all our great buildings, religious or secular, as shall ascertain which of them are, and which are not, duly provided with ample means of exit.

For buildings on one floor the rule is simple enough; and it is not one of the least valuable features in the modern movement for the restoring and building of churches that the clumsy expedient of the gallery is more and more disused. But when galleries are allowed in churches, and tiers of boxes and galleries in theatres, the inflexible rule that each plane occupied must have its own adequate and independent exit, with the flow of persons from which no flow from any other plane or story can mix or interfere, should be made imperative.

We need hardly add that the provision of an iron curtain, shutter, or pair of strong doors, to shut off the stage from the auditorium, should be imperative in every theatre. It may be said that this proved useless at Vienna. It would be more correct to say that this expedient, though provided, was not used there. Why not, we shall probably never know, but it is probable that all those whose duty it was to act lost their presence of mind at the critical moment. But this brings us to another point, without attention to which we have ample and reiterated proofs that the best provision for safety usually proves inoperative. Provisions for safety can rarely be made self-acting. At this moment we can only recall one, architecturally speaking, which is so, and that is the mode of exit from the amphitheatre which we have above described. The human element comes in, if it be but to turn a tap or to move a lever; and when suddenly called on to act, nine men out of ten, or more likely ninety-nine out of a hundred, lose their heads. If this hesitation be only for a few seconds, the mischief may be irremediable. It is of no use to lament; such is human nature, or rather, such has human nature become under the influence of civilisation. We do not fancy that the hardy warriors of Pepin or Charlemagne would have allowed themselves to be destroyed by the cause, whatever it was, that led to the destruction of the Ring Theatre.

Even in military sentinels we should place little reliance, unless they were men actually trained in the exigencies of war under the fire of the enemy. But there remains an expedient which we think might be adopted with admirable results. We are not aware whether it is at this moment in force in the Royal Navy. But in times when the Commodore of the Tagus or the Mediterranean Squadron hoisted his flag on a wooden three-decker it certainly was. At prescribed intervals,—that is to say, so many times in such a period of time,—but at utterly irregular and unexpected moments, it was the duty of the Captain of each of her Majesty's vessels to give a sudden alarm, to pipe his men to quarters, and to put his ship in such trim as would be required for instant combat; and a register was bound to be kept of the date of each use of this precaution, of the time occupied in getting all taut, and thus of the efficiency of the crew. Such a precaution would be as useful in case of alarm from fire as in that of sudden surprise by an armed enemy. In the case of a church or theatre the plan could be only partially carried out, as public opinion would resent its application during a service or a performance. But apart from this, if it were the duty of some official,—let us say an officer specially appointed by the Insurance Companies, under the sanction of a special short Act of Parliament,—to give the alarm of fire at some unexpected moment at every public building at least once in every year, and to note with what alacrity doors were opened, shutters closed, taps turned on, or any other well-designed safeguards called into instant and effective action, more would probably be done to preserve human life from the most terrible and sudden end than by any other method that we can imagine. Nor is it only to England that we address this counsel. We trust to hear it echoed from France, Germany, America. It is worth the careful attention of the civilised world, or at least of all those visitants of churches or of theatres who object to being burned alive.

PUBLIC SAFETY IN THEATRES.*

The burnings of theatres, whether in France or abroad, when frequently numerous victims perish, have always had the melancholy privilege of profoundly moving public opinion. The frequency of these terrible disasters appears to show, of itself, the insufficiency of the precautions taken to secure general safety. On the other hand, the inquiries undertaken on the occurrence of every disaster illustrate the necessity of increasing the proper means of preventing, or, at least, of diminishing, new dangers. It appears, moreover, from the figures of a curious statistical table, that the average life of a theatre before it is destroyed by fire does not exceed 43 years.

By fits and starts administrative commissions have been charged with the examination of various questions connected with the measures of security applicable to theatres; but until of late no complete study of the subject has been made.

Wishes have been expressed, some experiments made, but in the end no important modification has been effected in the old rules. In fact, the police supervision of theatres in Paris is to-day conducted in accordance with orders framed in 1828, slightly enlarged in 1864 and 1868, by supplementary regulations now recognised as being incomplete.

As to provincial theatres, they are generally still worse cared for. Not only do the regulations as regards precautions against fires leave much more to be desired than those of Paris, but the greater part of the rules which have been laid down are less frequently observed. In short, permanent supervision is far from being exercised with so much vigilance as in Parisian theatres.

Such was the situation when the news arrived of the catastrophe at Nice, the terrible consequences of which immediately revived the apprehensions of the public by exciting them to the highest pitch.

It is under the influence of this general feeling which was re-enforced by the recent disaster to the theatre at Montpellier that a new inquiry into the measure respecting the general security in the theatres of Paris, was ordered by M. Andrieux, then Préfet de Police, with a view of revising and completing previous regulations by putting them into harmony with the progress made in recent years.

The interesting studies of the commission named by M. Andrieux have served as the basis of the proposed new regulations with regard to the supervision of theatres, the moving circumstances of which are set forth with great precision in the report submitted by the Prefect of Police to the President of the Council, Minister of Public Instruction and Fine Arts.

In this report, which is remarkable for its

* Extracts translated from *Le Génie Civil*, November, 1881, which includes some diagrams.

precision and lucidity, the various questions relative to the security of the spectators and the persons employed in theatres are discussed *seriatim*, and are clearly summed up in a series of regulations to be observed by the proprietors or directors of theatres.

At the outset M. Andrieux is to be congratulated on his resolution to treat the question as a whole. It is impossible to effect any real improvement by any mere modification of the old regulations. On the other hand, it will not do to begin everything afresh. To attain the desired end it is essential that the new regulations should fulfil as nearly as possible the conditions required, and above all that these regulations should be capable of practical application. Now if the general spirit of the *ordonnance* of the 16th of May, 1881, correctly responds to the legitimate demands of the public, it is to be feared that the enforcement of its provisions does not produce all the good that might be expected from it.

Two principal observations appear to us to result from the attentive study of M. Andrieux's report: the first is that several clauses of the new law would only remedy imperfectly the dangers which they are intended to prevent; the second is that with regard to other clauses he has not taken sufficient account of the great difficulties which would result from their application. In concluding his report to the President of the Council, M. Andrieux shows, among other things, that the difficulties to which we here allude had not entirely escaped his observation. He justly foresees that the alterations and important works desired to be made to the various Parisian theatres will encounter considerable opposition. He trusts, however, to find the necessary support to overcome interested resistance in the force of public opinion. This support will not be wanting to M. Andrieux, nor to his successor, if, as we hope, the latter persists energetically in endeavouring to carry out the indispensable improvements long since called for in the public interest.

In the analysis of M. Andrieux's report, to which we are about to allude, we shall not make ourselves the advocate of the proprietors and directors of theatres. Our aim, on the contrary, is to assist as far as we can the municipal authorities by pointing out the new measures which are desirable, as well as by modifying or restricting, with a view to a practical solution of the question, such as appear to us as utopian or would interfere with the practical working of a theatre.

Having thus defined the scope of our inquiry, we now proceed to pass in review the different questions discussed in the report of the Prefect of the Seine, following the order adopted by M. Andrieux, and accompanying each of the principal points with comments which their examination has suggested to us.

The *ordonnance* of the 16th of May, 1881, has a threefold object:—

1. To guard as far as possible against danger from fire.

2. To secure in the case of fire prompt and sufficient assistance.

3. To render as rapid as possible the emptying of the theatre.

Under the first head come measures for the prevention of fire, the construction, and position; under the second head, regulations with regard to the fire brigade; and, under the third, those having for their object the improvement of the means of exit in order to facilitate the departure of the spectators and the persons engaged in theatres.

Construction.

The isolation of theatrical buildings is admitted in principle. The separation of the whole of the theatre from the neighbouring houses should be obtained by a passage-way around it of, at least, three mètres (10 ft.) in width. As this measure cannot be insisted on in the case of old theatres, it is proposed that an independent wall (*contre-mur*) of brick shall be added to existing buildings in order to protect the party-walls from danger from fire.

It is further proposed that the three great divisions of the theatre, auditorium, stage, and administrative buildings, shall be separated by thick walls. It is further proposed to prohibit in any portion of the auditorium any workshops or store-rooms, in order to keep away from that part of the building used by the public everything that might serve as fuel for fire.

Finally, the erection of firemen's balconies in the highest part of the stage is recommended to allow the firemen to obtain complete command over this part of the house, and to make their escape in the event of danger. All this is excellent, but with the exception of the independent wall and the firemen's balconies, it is at once seen that the above recommendations can only apply to theatres to be built in the future.

Wherever a theatre is placed between houses, and the case is unhappily very frequent in Paris, it is clear that we cannot obtain the passage around recommended, because this isolated maximum of three mètres (10 ft.) in width could only be obtained by encroaching on the space (always too scanty) for the work of the theatre, and still less could it be obtained at the expense of the adjoining houses except by their compulsory purchase.

There remains, then, only the independent brick wall, which would be sufficient to preserve the party-walls, but which would not hinder the fire from spreading by means of the roof. At the time of the fire in the great theatre at Rouen, the higher stories of all the neighbouring houses were destroyed by the fire, which was communicated by means of the roofs. This danger would be greatly diminished, as we believe, by requiring in certain cases the raising above the roof of the lateral party-walls in such a manner that they should exceed the height of the highest portions of the roof of the theatre.

In the majority of the Parisian theatres the premises belonging to the three departments into which the theatre is divided are intermixed, instead of being distributed in different separate buildings. The separation of the departments by thick walls cannot, therefore, now be effected without interfering with the whole of the building. For the same reason it will probably be very difficult to obtain the transfer of the store-rooms or workshops near the *salle* to another part of the theatre, where the other offices are already too cramped. As regards the firemen's balconies, these should be placed outside of the stage; on the inside the corridors and bridges for the scenery serve the same purpose. The access to these should be made more convenient.

With regard to existing theatres, it does not appear to us at all possible to lay down any general rules. The only means of effecting any serious tangible improvement of the actual state of things is that indicated in the report, viz., to form a commission, composed of competent men, who should be empowered to make a careful and special investigation on the spot of each theatre, and afterwards to require the rigorous execution of all works which shall be specified, and are recognised as being practicable, care being taken that they are completely carried out.

As regards regulations for the construction of new theatres, their scope should, we think, be much more extended than those which are indicated in the law of the 16th of May. We cannot enter here into details as to these technicalities, which would involve us in explanations too long for the pages of a review.

Reserving for future consideration these special measures, we shall limit ourselves for the present to the following points as being necessary, viz.:—

1. Isolation, as complete as possible, of the theatre from the neighbouring houses.

2. The exclusive employment of brick for the construction of all interior walls.

3. The exclusive employment of iron for the construction of the floors, roofs, and of the framework (*ossature*) of all decorative work.

The roof should be of metal, or of slates secured on to the rafters by copper hooks, or galvanised iron.

All the openings in the proscenium should be provided with doors of solid sheet-iron, in such a manner as to permit of the isolation from the fire of the adjoining premises.

Scenic machinery should be constructed entirely of iron.

Covering in plaster of all the interior surfaces of the roofs, as well as all the small parts where wood has been necessarily used.

The establishment of a fire brigade in the immediate neighbourhood of the stage, &c.

Iron Curtain.

According to the prescriptions of the 16th of May, "the opening between the stage and the auditorium shall be closed by an iron curtain, which, being suspended by combustible cords, shall fall automatically in case of fire, and shall have counterweights to regulate its descent." The curtain here referred to exists already in nearly all the theatres in Paris. It is composed of an iron frame, divided into triangles by iron laths, and filled in with a trellis of iron wire. The usefulness of an iron curtain so constructed has been much contested.

Many persons, ourselves amongst the number, think that it does not fulfil its object, inasmuch as it does not oppose any serious obstacle to the spread of fire from the stage to the auditorium. Not only, we believe, would the bearers and the uprights on which the scenery is fixed, easily tear in their fall so feeble a trellis; but supposing even its mesh resisted the shock of heavy *débris* falling from the flies, and rebounding on the stage, it is necessary to admit that the flames attracted towards the auditorium by the flue from the sun-burner in the centre of the house would readily pass through this curtain, and would then rapidly communicate the fire to that part of the theatre used by the public.

By continuing the requirement of this curtain with a large mesh, the condition of affairs is not improved. This appears to us the more to be regretted, that remarkable progress has been made in this respect in several theatres abroad, and that improvements are on the point of being adopted in several of the provincial theatres in France.

Amongst improved iron curtains we will instance at once that of the new theatre at Geneva, composed of three thicknesses of trellis-work, separated from one another.

The frame is made of two pieces of (half-round) iron, holding a metallic gauze, with a very small mesh. This gauze, which is similar to that of a miner's safety-lamp, absolutely stops the progress of flame. But its thinness renders it very liable to be broken: hence it is protected from blows on its two sides by a double trellis-work of stout iron wire, of $\frac{1}{10}$ in. in diameter, with a $\frac{1}{4}$-in. mesh, and strongly fastened to the back of the frame. Thus arranged, this triple trellis-work evidently possesses very great resistance, and it can be assumed that it would present an effective obstacle to the spread of fire.

This iron curtain, designed by M. Diosse, master carpenter, has been in use for the last two years at the theatre of Geneva. It is rolled upon two iron drums, and counterbalanced by weights. The ascent and descent are accomplished by means of a roller, checked by an automatic brake working outside the stage. The weight of this curtain is 2,500 kilogrammes (2½ tons), and the total cost was 320*l*.

The iron curtain of the Théâtre des Célestins, at Lyons, which has just been rebuilt, is constructed after the same principle, of a sheet of thin metallic gauze, protected by two strong trellises, with a large mesh. But here, for greater precaution, the frame of the curtain is made of stout sheet iron, 2 mètres wide, in such a way as to still more completely protect the stage boxes and other parts of the house nearest to the curtain.

On account of the limited dimensions of the stage, the weight of the curtain is only 1,800 kilogrammes (1¾ ton). The entire cost has been 7,000 francs (280*l*.).

Although these curtains offer a certain security against the spread of fire, we find that they have two serious defects, of which we now proceed to speak.

In the preceding remarks we assumed the fire to originate upon the stage. This is, indeed, the most frequent, and by far the most dangerous, instance. We would almost say the only dangerous instance, for there are very few cases of fires in theatres originating in the auditorium, where the fire would be tolerably easily subdued, the combustible materials there being comparatively small in quantity.

But it is not sufficient simply to prevent the flames from entering the auditorium; it is not less indispensable, in our opinion, to prevent the smoke from spreading there. Now, painted canvas and the framework of scenes, which are always found in considerable quantity on the stage, fall to pieces immediately on catching fire, produce an abundance of black smoke, which would be drawn into the auditorium by the flue over the central chandelier, would easily pass through the finest metallic curtain, and would at once stifle the spectators, who, from the blocking of the passages or other cause, would be prevented from rapidly escaping. Facts have proved that in numerous fires in theatres the victims had died from suffocation.

It is thus of equal importance to prevent the passage of smoke into the auditorium, and to do this there is but one way. A close curtain of

iron, covering completely the proscenium opening. This curtain would, besides, have another advantage, that of hiding from the public the progress of the fire. We must insist upon this latter point, to which we attach very great importance. That which is most to be dreaded during a fire in a theatre, should it break out during a performance, is the panic produced amongst the spectators by the sight of flames. It is this which causes the obstruction of exit passages, the frantic rushes, the heaping up of bodies, and eventually suffocation.

Every suitable means for diminishing panic, it seems to us, then, should be employed, and we think that a close iron curtain, concealing the flames and presenting, as well, a serious obstacle, would contribute much to reassure the public. This is why we strongly advocate the employment of a close curtain of sheet iron, which should, we consider, be required for every theatre.

This suggestion is not an innovation, and, in adopting it, the City of Paris would only be following afar Germany, America, and shortly the provinces of our country. There existed, in fact, for several years, a close curtain of corrugated iron, of large size, in the theatre of Dresden, and in a great number of theatres of second-rate towns in the United States. In France, several such curtains are now being made, intended for the theatres of Besançon, Lille, and Toulon.

These latter are fixed according to the system patented by MM. Grafton & Co., engineers. The curtain is formed of a series of sheets of iron, which are raised one over another during their ascent, hung with hinges similar to those used for shop-shutters. The curtain is moved by hydraulics by means of an accumulator and piston working an endless chain. Without entirely approving of certain details of this system, we nevertheless consider it as a notable improvement which is to be commended.

The incontestable advantages of a close iron curtain appear to us so important, that notwithstanding the rather high price of this kind of division, we have hesitated in recommending its employment to the municipality of Rouen for the Theatre of Arts, which is now being rebuilt.

It is worked by hydraulic machinery, working by means of two pistons set in motion by two taps placed outside the stage, and forcing the water into lateral tubes. A third tap placed below these serves to empty the pipes in the event of repairs by necessity.

This solid curtain, which is in one height, weighs 4,000 kilogrammes. It will be counterbalanced by weights for nine-tenths of its total weight, and the remainder will be raised by the pressure of two columns of water, one at each side, upon which the curtain, when raised, will be supported during the time of performance.

The entire cost of this curtain, including the pipes for the admission and emptying of the water, the pistons, the guides, and the counterbalance weights, as well as the suspension-ropes of thick steel, and all the necessary fittings, would be from 14,000 fr. to 15,000 fr. (560*l.* to 600*l.*). By causing this same curtain to be worked non-hydraulically, but by means of a windlass with a self-acting break, the expense would be reduced to 9,000 fr. (360*l.*).

Lighting.

As the report by M. Andrieux states, nearly all the disasters which are produced in theatres have been caused either by an accident happening to the gas-piping or lighting apparatus through their defective or incomplete fixing.

On the stage, and especially in the flies, the danger is constant on account of the accumulation of the most combustible materials, in the midst of which are distributed a large number of movable gas-jets necessary for the changeable lighting of scenery. Gas, then, is the formidable enemy against which we cannot take too many precautions. The question, also, of replacing gas-lighting by electricity was discussed as soon as the discovery of the application of motive power to the economic production of electricity was made. It appears, unfortunately, that gas could not be completely dispensed with in the lighting of theatres; many experiments have been made but without giving practical and conclusive results.

The most that can be hoped for at present is the introduction of a mixed system of lighting, electricity being used for large spaces and certain effects of the *mise-en-scène*, and gas for small spaces. It seems reasonable, then, that the Order of the 16th of May imposes conditions with regard to both the methods of lighting.

The first condition required concerning gas is that of having a separate meter for each of the three divisions of a theatre, so as to prevent the sudden extinction of lights in the whole of the building. To prevent complete darkness in the auditorium in case of the extinction of the chandelier, it is also prescribed that the manager shall keep oil-lamps in all parts of the auditorium accessible to the public; and during the whole time of the performance a sufficient number to permit the public to see their way out.

The principle of these precautions is certainly excellent, but it is necessary that they should be properly carried into effect. And would it not be possible to arrive at the same result in a manner more simple,—in determining, for example, the general distribution of the gas, in the following manner?

The first meter should serve for lighting of the scenery and the auditorium. The second meter would supply the wings of the stage and the administration-rooms. The third meter, lastly, would light the staircases, vestibules, passages, and back rooms of the auditorium, as well as a certain number of gas-jets distributed in the interior of the house, to the various boxes and corridors, which would allow persons to see their way, even after the extinction of the central chandelier, without the necessity of any oil-lamps. This would avoid the inconvenience of a supplementary system of lighting. It would be necessary in order to complete this arrangement that three meters should be placed in a position easily accessible, and also brought as near as possible to the public way. In case of an alarm on the stage the gas supplying the footlights could be cut off at the meter; then, if needed, the gas supplying the wings of the stage, leaving alight all the internal jets of the auditorium, and the lights of the corridors.

The report of M. Andrieux goes on to say,—"That it would appear equally useful to compel the managers of theatres to execute in iron all the large gas-pipes, in order to prevent the escapes so frequent in leaden ones."

We also are in favour of the use of iron pipes for the distribution of gas in theatres; yet opinion is much divided respecting the preference to be given to iron or lead pipes.

Escapes rarely take place in the length of pipes. It is at the joints they most commonly occur, and the number of joints is about the same in the two materials.

As a matter of fact, many of the theatres of Paris have their gas-pipes of lead, and the advantage of one system over the other does not appear very marked. Is there reason, in consequence, to compel the proprietors of theatres (for it is they whom this concerns, and not the managers) to immediately replace all their gas-pipes? This would occasion a heavy expense, while the result to be obtained is of small importance.

We think that it will be sufficient to render compulsory the use of iron gas-pipes in theatres to be erected, and to prescribe their use in executing necessary repairs and partial substitution of existing pipes. This should apply to the ground-lines, and all lights should be protected by wire-guard work. These guards are already in use in the greater part of the Paris theatres.

As an improvement used lately in the apparatus of scenic-lighting, we here describe an improved float invented by M. Diosse, the use of which should be general. The ordinary floats are merely enclosed in a single tube of sheet-iron, often overheated by a number of cylindrical gas-jets which it conceals. On several occasions, in the old theatre of Geneva and elsewhere, fire has been communicated to the threads of light cloths fluttering on these almost red-hot coverings. The new float by M. Diosse remedies this danger by means of a second covering separated from the first by a current of air, preventing the overheating of the outer surface.

For the footlights the Order of the 16th of May requires the use of jets reversed, with the view of absolutely protecting the dresses of the actors approaching the proscenium. The system of reversed jets has certain advantages, but it has many drawbacks, not the least of which is that it increases enormously the consumption of gas. Moreover, the construction is complicated, the regulation of the jets is very difficult, and the rapid replacement of broken glasses during the performance is difficult. These defects, which are very annoying in practice, have caused this system to be abandoned in many theatres where it had been introduced at great expense; at the present time it is only used at the New Opera.

It seems to us that without increasing the danger, the jets of reversed flame could be dispensed with, by fixing to the reflector of the footlights the double envelope fitted to the float by M. Diosse, and in making it obligatory for all theatres to be provided with an iron wire screen placed immediately in front of the footlights, which is only used in a few theatres. Thus modified, the ordinary footlights would offer, we believe, nearly all the same guarantees of safety with that of reversed lights without their inconveniences.

A defect easily remedied would be to render obligatory the employment of metal ropes for the suspension of the float, and other apparatus of movable lighting, and also to impose everywhere the use of regulators in order to prevent a sudden lengthening of the flames at the nibs, in case of sudden changes of pressure in pipes.

With regard to the installation of lighting by electricity, the regulations are confined to requiring the complete isolation of wire for the transmission of the currents, and preserving them from breakage by enclosing them in a strong and incombustible casing. It wisely adds that precautions shall be taken to prevent the fall of incandescent carbon.

On the occasion of the experiments in electric lighting made at Rouen, we were able personally to testify to the necessity for precautions in this regard, as well as to prevent sparks flying (*petittements d'étincelles*), on account of the impurity of the carbon pencils. During a performance, the commencement of a fire, occasioned by an electric lamp, broke out on the stage of the Théâtre Lafayette. Fortunately, the accident occurred during an entr'acte, the curtain being down, and the fire was rapidly extinguished unknown to the public.

The position of dynamo and other machines for generating electricity should be the object of conditions and special authorisations.

The diversity of systems of electric lighting, and the undecided nature of their working, compel us to confine ourselves, at least for the present, to these generalities.

L. Sauvageot, Government Architect.

DEATH OF THE PRESIDENT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the meeting of the Institute held on Monday evening last (Professor T. Hayter Lewis, vice-president, in the chair), after the minutes of the previous meeting had been read and confirmed, it was announced that the secretaries had received a letter from the hon. secretaries of the Architectural Association, in which the writers said they had seen with very much regret the announcement of the death of the President of the Institute,—a regret which would be shared by all the members of the Association. The Institute, in common with the whole profession, had sustained a great loss by the death of one of its most distinguished members. The writers desired to be informed of the arrangements for the funeral, in order that the Association might be duly represented thereat.

The Chairman,—I need scarcely tell you, gentlemen, of the event which has just taken place. But before I allude to it more particularly I have another sad task to perform, namely, to allude to the deaths of two other of our most distinguished members,—Mr. Salvin and Mr. Decimus Burton. Mr. Salvin was well known some years ago as a very earnest worker in the profession, and, having made a study of old castles, his advice was sought and taken in the extensive restorations which have taken place of late years in the Tower of London. Mr. Decimus Burton had long ceased to practise, but his principal works were very well known, and included the Athenæum and United Service Clubhouses in Pall Mall, and the entrance to Hyde Park at Hyde Park Corner. In his time no architect was better known, and none was more respected. I have now to allude to the real business of the evening. The Council, of course, could not by any possibility postpone this meeting, the sad event of Mr. Street's death having happened at so recent a period, namely, at about half-past ten yesterday (Sunday)

night. I told you at our last meeting that I had had an interview with him; I likewise read a portion of a letter from his son, and I knew at that time that the feelings of his physicians were decidedly hopeful. All signs continued to be favourable, and last Friday he was to have left town for Egypt, where he hoped to have passed some short time in entire repose. It was a new country to him,—a country which he had always hoped to see, and had he had the opportunity, he would doubtless have made good use of both pen and pencil in recording his impressions of his sojourn there. Man proposes, but God disposes. On Thursday afternoon last, while he was sitting conversing with one of his old friends, a Royal Academician, he was struck down suddenly by a severe stroke of paralysis. The whole of his left side was paralysed, and he was rendered speechless. He remained conscious for a short time after the attack, but he soon became unconscious, and so remained up to the very last. He had, I need scarcely say, every possible advantage which the skill and science of his physician and the love of his family could bestow, and I believe he likewise had the most affectionate care of his domestics. He has been too much before the artistic world for me to need to give you much of his history, and you all knew him too well, and respected him too much, to render it necessary for me to say much in his eulogy. To many of us he was known as a friend, hearty and cheery, and of ready wit, giving and taking sallies and home-thrust in a most playful way. Above all, he was sincere. Fearless in asserting his own views, he no doubt sometimes came into collision with others, and perhaps sometimes appeared to bear rather harshly upon them. But you must forgive a man who speaks and does fearlessly what he thinks. From my personal knowledge of Mr. Street for years I am able to apply to him the words which Shakspeare makes *Polonius* say to *Laertes*, for he was indeed a friend to be grappled to one's soul with hooks of steel. To all of us he was known as a skilful artist and as a most powerful writer on our art. He was a fearless champion of the views which he considered right, regardless of what others thought; and whatever the results to himself might be, he had the courage of his opinions, and stuck to them through thick and thin under all circumstances, no matter what the loss of profit or office might be. Most people knew him best by his works, and in the conduct of those works he was known as a high-minded gentleman. He was a friend of all that is true and noble in art, and the friend of all about him, sparing no exertion of any kind to advance his art. Attending to his work in the most minute details, which he looked upon as important to the carrying out of a design, he was an absolute master of every detail in his buildings. To all those who knew him well and could see him at work he was a marvel of power and of action. Most of you, I dare say, know that in that great work of his, the New Law Courts, there are hardly two windows or doors all over the building which have the same mouldings, and yet, there is not a single moulding, whether in wood or stone, which was not drawn out by him with his own hand full-size. Others will speak more worthily than I; I dare say at greater length, and better, but no one can be more sensible than I of the loss of a dear friend, and no one can feel more keenly than I do that a great power in art was lost and passed away when George Edmund Street died. Gentlemen, it is hardly necessary for me to add that the Council have passed a resolution of condolence with the members of Mr. Street's family. That resolution, which I am sure will have your hearty concurrence, is to this effect:—"That the secretaries be requested forthwith to draw up and transmit to Mr. A. E. Street a letter in the name of the Council expressive of the sorrow of the members of the Institute, corporately and individually, at the sudden death of their President, and of condolence with the family in their bereavement."

Mr. Wyatt Papworth said that the letter should be sent in the name of the Institute, and not in that of the Council merely.

The Chairman said that was, of course, the intention.

The Right Hon. A. J. B. Beresford-Hope, M.P., said,—I quite agree with that very proper suggestion, and I rise to move that that resolution of the Council be adopted by this meeting. It is a painful duty for me to perform, but I find, on looking round the room, that I enjoy the melancholy pre-eminence of being the senior past-President here. In that character, then, I venture to come forward, in this moment of stunning grief, to make myself the mouthpiece of the Institute as the Institute, and not only of its governing body. In this dreadful year 1881 we seem to have been continually walking *in tenebris et umbra mortis*, and I thank God that there are only about ten days of this most terrible year to pass away. I cannot help reflecting that it is just six weeks ago to-night that I was standing up where I stand now and addressing him who then, as President, occupied the President's chair, apparently healthy and vigorous, and who had just before delivered a grand and massive address, well-conceived, logical, well-argued, powerful in tone, admirable in composition. We all were proud of him, and could any of us have thought then that in only six weeks we should have to meet as we are meeting to-night? Really, I feel that "we have come to bury Cæsar, not to praise him," but still, something must be said. You, sir, have embodied so well, so fully, and so clearly, the great and good points of his grand character that I feel that there is very little for me to add. His honesty; his boldness; the way he conquered people by the conviction that about him was no trickery, no diplomacy in the bad sense of the word; his fearlessness and earnestness in the advocacy of what was right and true and beautiful, whether in the moral or the material world, were all grand traits in his character. He has passed away young, but he has passed away in many senses full of honour,—passed away our President, and ten years a Royal Academician,—passed away just completing *the* monumental building of our own later generation,—the building which will be, we hope, for generations after generations (if, as we hope, the British Empire and British Monarchy will go down from age to age), unless some unexpected catastrophe occurs to it, the palace in which the administration of the justice of this great empire will be carried on. He has gone, following only at a distance of a few months his honourable rival Burges. Both of them Death's trophies in this year 1881! To pile up words would only be to weaken the feeling of sorrow that wells up in all our hearts. I move that the resolution read be made the resolution of the Institute, and would suggest that after that we dismiss all other business, and separate to meditate in sorrow upon him we have lost, whom we should take as a personal and artistic exemplar in our exertions.

Mr. Horace Jones.—After the excellent speeches we have heard, I think the fittest tribute we can pay this evening to the memory of our late leader and companion will be to cease our business for the night. I therefore move the adjournment of the business of this meeting.

The Chairman said he must first of all dispose of the motion made by Mr. Beresford-Hope, but which had not been seconded.

Mr. Charles Barry, in seconding Mr. Hope's motion, said,—I am sure it must be the anxious wish in the hearts of every one here to express the feelings which individually animate us with regard to our late President. Those feelings have been well expressed by you, sir, and they have been further well expressed by Mr. Beresford-Hope, but I cannot forget, and I shall feel privileged in remembering all my life, that during the time I had the honour to occupy that chair, Mr. Street was my loyal co-adjutor as Vice-President. Much superior to myself in mental vigour and in artistic power, he yet did not feel it to be inconsistent with the powers which he knew himself to possess to support me loyally during the three eventful years during which I occupied the chair. It is known, of course, that on certain points we have felt it our duty to take somewhat different views, but I can bear witness to the absolute sincerity and honesty of Mr. Street's character, inasmuch as though we were in the position of differing on certain points, we felt for each other, and I am sure he felt for me as I felt for him, both of us being assured that the only object either had in view was to benefit the profession to which we belonged, and to add to the stability and permanence of this Institute with which we were so fully identified. Outside these walls, and beyond that official difference of opinion, our friendship, which was the growth of many years, and which was cemented greatly by the three years of our working together here, never faltered for a moment. Cordial, kind, genial, personally friendly, Mr. Street always was to those who had the privilege of knowing him well, and I hardly know how to express the feelings which I experience now at the suddenness of the stroke which has deprived us of the assistance of our distinguished late President. I shall not add any further words, but I could not be here without testifying my deep sense of the great and exceeding loss which this Institute and the whole profession have suddenly and so unexpectedly sustained.

Mr. Ewan Christian.—I am sure we must all feel that a great light has been quenched, and that a prince and leader among us has fallen. The fewer words spoken on this occasion the better, and I therefore venture to second Mr. Horace Jones's motion that we do now adjourn.

Both motions were adopted, and it was announced, as the meeting closed, that Professor Hayter Lewis, as the senior Vice-President, and the two secretaries, had been appointed by the Council as a committee to take such immediate steps as they might deem necessary to do honour to the memory of the President, and to make known, as far as possible, the arrangements as to the funeral.

THE WESTMINSTER PLAY.

IN these days, when theatrical matters absorb so unusually large a share of public attention, it can be understood that the Westminster Play is not likely to have lost any of that interest which it has for so long excited in certain circles. The Westminster Play is thoroughly well understood as the classic play acted by the Westminster boys in accordance with a time-honoured custom observed for generations past in most schools throughout England, and which now seems definitely to have taken root on the other side of the Atlantic, where the oldest of the American universities, Harvard, mounted, not long since, the "Œdipus Tyrannus," with a luxury of costume which, if we are to believe the series of illustrations that appeared in an American magazine, approached as nearly as possible the Greek ideal. But dramatic power we can scarcely look for in the schoolroom, and the "Œdipus" even of Harvard, with all its care, we may be sure fell very far short of the play which, in a French translation, was put on the stage of the Théâtre Français not long since, and interpreted, as the play requires, with masterly skill by a well-known artistic company.

It is scarcely in a critical mood that one visits the old dormitory of Westminster School, which is annually fitted up for the play, and on the dusky walls of which are scored, scratched, and painted so many of the names of old Westminster boys, forming, it is true, not so architectural a wall decoration as the painted armorial bearings of past *alumni* which crowd the staircases and passages of the old dormitories of Padua and Bologna.

The play chosen this year by the Westminster boys was Terence's amusing comedy of the "Adelphi; or, the Brothers," an old favourite, "conveyed,"—to employ a word now in use to express a practice as well known in the days of Terence as in our own,—from the Greek of Menander. As may be imagined, the success of Thursday, the 15th inst.,—the first night of the series of three performances of the play,—was great, and it scarcely required the well-measured and traditional admonitions of the "god-keepers," with their long canes, to prompt the applause of the audience; the brilliancy and quickness required in the action of the play, could not, of course, be expected from scholars, even less experienced than what are so generally understood in this country as amateurs. The comedies of Terence are singularly modern in their spirit, as any translation will show. We hear, or rather have heard, a great deal of the need for the revival of our fine old plays, many of which are not improperly regarded by some as fine old bores, but the Greek wit and wisdom of Terence, Roman though he was, tells as well now as it did when, centuries gone by, it roused the mirth of audiences to whom the language of the poet was familiar, as still, for centuries to come, the well-weighed sentences will supply an ample fund of thought and worldly wisdom to the reader. If, as Mr. Russell Lowell told us the other day, quoting an American proverb,—taken over from our country,—there is a great deal of human nature in man, we are still the men whom Terence studied, for whom he wrote.

It would be perhaps asking too much from the Westminster boys to expect that, in addition to the representation of a classic play, they should give us between the acts classic music. The audience would be exacting indeed who required, to accompany the "Adelphi" of Terence,

the quick music of the Sarranian flutes, which, we are told, with freedom, Flaccus composed originally for the piece. Bizet's "Carmen" and Mr. Sullivan's ever-popular "Patience" formed, perhaps, a better substitute more in accordance with that good-humoured indulgence with which we now are expected to receive the "waits" between the acts. As a matter of what our French neighbours term *actualité*, the chief interest of the Westminster Play for most persons is centered in the epilogue, which, contrary to custom, was given on the first night.* Here enters the charm of novelty, for the epilogue deals in choice modern Latin, with a variety of contemporary topics. It can be easily understood that the epilogue this year did not neglect to touch in amusing terms on the Irish question, and loud was the laughter raised by a variety of the political "hits" made; but the heartiest and most prolonged applause of the whole evening was reserved to the *finale* of the epilogue, when a huge packing-case, duly labelled "*cum cura*," was hauled on to the stage amidst various timid suggestions made that the package might prove to be an infernal machine, but from which was eventually dragged a large model of Ashburnham House (restored). The well-composed and warm words which accompanied this discovery were interrupted during several minutes by the applause of the whole room, renewed when the determination was expressed to preserve as an honour and glory to the school this choice architectural relic, the threatened destruction of which has justly roused so much indignation in all quarters.

THE KING OF SPAIN'S COMMISSIONER ON ENGLISH ARTISANS' DWELLINGS.

Señor Mariano Belmas, the special envoy of the King of Spain, has now returned to Madrid to report to his Majesty the result of his inquiries relating to the artisans' dwellings of England. Señor Belmas is the editor of the *Revista d'Architectura* and secretary of the Central Society of Spanish Architects. Some months ago a congress of architects was held at Madrid under the auspices of this society, and the king presided in person at the sittings; taking not only an active interest in all the debates, but delivering the opening speech. This oration was more than a mere display of that eloquence and fluency of speech for which Don Alfonso is now renowned. The king, by insisting with much earnestness and at great length on the importance of providing suitable dwellings for the poorer sections of the community, initiated a movement which must bear beneficial results of a most practical description. It fortunately happened that Señor Belmas, who, as the secretary of the congress, was brought into frequent personal communication with the king, had not only studied this question, but made several experiments in the outskirts of Madrid.

Utilising the sand which abounds in the neighbourhood, Señor Belmas mixed it with cement and formed a sort of concrete with which to build the main portion of his walls, and thus reared a number of little houses which only cost 100*l.* each, and this included the cost of the land, estimated at 20*l.* for every house. These houses consist of two floors and four rooms, with ogival roofs, a form Señor Belmas found to be cheap, strong, a little more elegant, and affording great facilities for ventilation.

The discussion during the congress so interested the king, that he determined to send some competent person to England and to the United States to inquire what had been done in those countries to provide dwellings for the poor, and, in selecting this envoy, his choice fell not unnaturally on Señor Belmas. But as, considering the somewhat troubled condition of Spanish politics and finances, it would have been difficult to have obtained a Government grant for this purpose, the king resolved to defray the cost of this mission from his private purse. It was, therefore, as the personal envoy of Don Alfonso, and not as the emissary of the Spanish Government, that we had the honour of welcoming Señor Belmas on his arrival in London; and before his departure we were not a little curious to know what were his impressions. In the fulfilment of his mission, Señor Belmas conscientiously visited the estates of the Artisans' Dwellings Company, the Peabody Buildings, and many other model and recent creations; but, so far as the economy of building is concerned, he failed to discover anything important that could be imitated in Spain. Spanish customs are so radically different that it would be extremely difficult to create on a large scale special dwellings for the poor. In Spain the poor live with the rich and under the same roof. The first-floor or flat of a Spanish house will be rented to a wealthy, perhaps an aristocratic, family; the second-floor to a family well-to-do, but not so rich; the third-floor, divided into two separate apartments, would be occupied by lower middle-class tenants; while higher up, each room is let in separate tenements and occupied by workmen and their families. Of course, according to the general character of the house, the various tenants are more or less wealthy or high-class; but, however noble or however humble the dwellings, the diversity of position between the inhabitants is always in about the same proportion, and as we ascend the stairs so we, in equal ratio, descend the social scale. The Spanish people would not tolerate any system that parks off various classes into various districts, like different breeds of sheep, in separate pens. The mixing of different classes under one roof is an important factor in Spanish life, and in no country does the maxim, "Charity begins at home," apply more appropriately than in Spain. The wealthy occupants of the first floor have only to ascend the steps of their own house to find worthy objects of compassion in the attics. This, indeed, gives rise to considerable familiarity between rich and poor, and the ignorance and indifference too often shown in other countries as to the condition of the poor are less prevalent in Spain.

Under these circumstances, any system of dwellings which would compel poor people to live together would certainly occasion considerable opposition. They would naturally object to be severed from their wealthy neighbours, who so often prove themselves useful friends in the hour of need. These observations apply, at least, to large towns, but not to the neighbourhood of factories, mines, and other industrial districts, where of necessity colonies of work-people must be grouped together.

Of the model dwellings in London, Señor Belmas was specially impressed by the most recent Peabody buildings, where turrets disconnected from the main part of the dwelling contain the closets, &c. He also spoke very favourably of the Shaftesbury Park Estate, so far as the general scheme is concerned, but found the structure of the dwellings somewhat flimsy, while it seemed to him that the land of the Queen's Park Estate was very damp, and that some of the houses were being built on refuse. With these exceptions, the Spanish delegate had nothing but words of praise to utter relating to what he had seen, to the facilities afforded him, and the hearty reception he had received. The readiness with which all documents, reports, and balance-sheets relating to all enterprises having a public interest were communicated to him, afforded a favourable contrast to what would have been done in Spain. The printing by municipal or local authorities, and free circulation among the public, of reports relating to all administrative questions, the way in which criticism was accepted, and even courted, were striking and admirable features of English life.

But the one point, surpassing all others, that will constitute the principal feature of the advantages resulting from Señor Belmas's mission, is the impetus it will give to the introduction of sanitary reform in Spain. In this respect, an entirely new field of action has been opened out. Everything Señor Belmas saw was new to him. In Spain no effort whatsoever is made to prevent the admission of sewer gas into dwellings. Intercepters, methods of ventilating house-drains, the care with which closets are ventilated, and, if possible, placed without the walls of the dwellings, the mortality statistics which establish the necessity of taking these precautions, and the saving of human life resulting when they are efficiently carried out,—all this was new to the king's delegate. Fortunately, the novelty of the subject did not militate against its importance. Señor Belmas was fully aware of the gravity of this topic, and had already joined the Madrid Sanitary Society; but had had no opportunity of studying the practical details, the mechanical appliances, which in this country have attained a comparatively high degree of perfection. Nor was he aware of the rigour of our law with respect to disinfection, and the remedying of unwholesome dwellings. All these matters will now, however, be skilfully laid before the King of Spain, and action will doubtless soon be taken. The high death-rate in Spain, the dangers we run of contracting typhoid and other fevers when we visit that interesting country, give us a personal as well as a general interest in this prospect of sanitary reform; and we are glad to think that the king himself is likely to take the initiative in this movement.

NOTES FROM THE WEST.

Steam having been used on one section of the Bristol tramway for a year, has been this month superseded by horse-power. A great many complaints were made by occupiers of property adjoining the route of the noise, smell, and inconveniences attending steam-working.

A company has just been formed in Bristol for supplying electric lighting and electricity as a motive-power on the Brush system, Lane-Fox incandescent lamps being used for domestic purposes.

Messrs. D. Glass & Co. have had extensive premises erected for them at the union of Clare and New Baldwin streets. The design is effective, and displays a series of carvings representing tobacco growing, importation, and manufacture. Mr. H. C. F. Hansom was architect, and Messrs. W. Cowlin & Son, the builders.

A peculiar dispute has arisen between Messrs. G. C. Ashmead & Co., one of the oldest firms of surveyors in Bristol, and the St. George's Local Board. St. George's, a district of about 30,000 inhabitants, just outside the Bristol boundary, a few years ago connected its drainage system to that of Bristol, and Stapleton, another large country parish adjoining, unable to satisfactorily dispose of its sewage, arranged to connect with St. George's. Messrs. Ashmead drew out the levels, which they calculated from a "bench mark," the elevation of which had been ascertained years ago, and fixed by the firm in Stapleton-road. On the work being gone on with, it was found that the sewers would not connect, the Stapleton end being lower than anticipated. Messrs. Ashmead could only account for the error in the calculations by assuming that an extensive subsidence had occurred in the district in which the "bench mark" was placed, but agreed to leave themselves in the hands of the St. George's Board, and were required by that body to pay 200*l.*, this being one-third of the expense attendant upon the mistake. Since then it has been clearly proved that the subsidence conjectured had taken place. It extended over a length of road of not less than 600 ft. or 700 ft., and the deepest sinking was as much as 2 ft. 3 in. Near the "bench mark" the subsidence amounted to 1 ft. 10 in. This being so, Messrs. Ashmead decline to pay such a sum as 200*l.*, but the Board argue that they had nothing to do with the "bench mark," and have resolved to enforce their claim.

A rather interesting discovery has been made at Gloucester Cathedral. A memorial brass being moved from the north-western transept, where it was trodden upon, to another part of the building, an excavation was made, and the workmen came upon a massive slab of freestone, 8 ft. long, 5 ft. wide, and 6 in. thick. It was found to be the memorial stone of one of the abbots, turned face downwards, it is thought, by the Puritans, before the present raised pavement was laid down. Examination of the stone leads to the belief that it is that to the memory of Abbot Thomas Horton, who governed the church twenty-six years, and resigned 1377. During his long term of office he provided the abbey with many vestments, and gold and silver vessels and candlesticks for the altar, and caused a great part of the presbytery, the St. Paul's aisle, and the guest-hall to be made.

Fires in Theatres.—The Glasgow Justices of the Peace have issued recommendations to theatrical managers to have separate exits for each class of audience; to inspect the whole theatre before the performances begin; to see that the appliances for extinguishing fire are in proper order; to cause the lights in the lobbies and stairs to be supplied from pipes different from those supplying light to the auditorium. The Lord Provost recently intimated to the Glasgow Town Council that the magistrates had visited all the theatres and made suggestions for the public safety. The lessee of the Glasgow Royalty Theatre has already introduced oil lamps into all the stairs and lobbies of his theatre.

Whiteman & Bass. *Photo-Litho* 236, High Holborn.

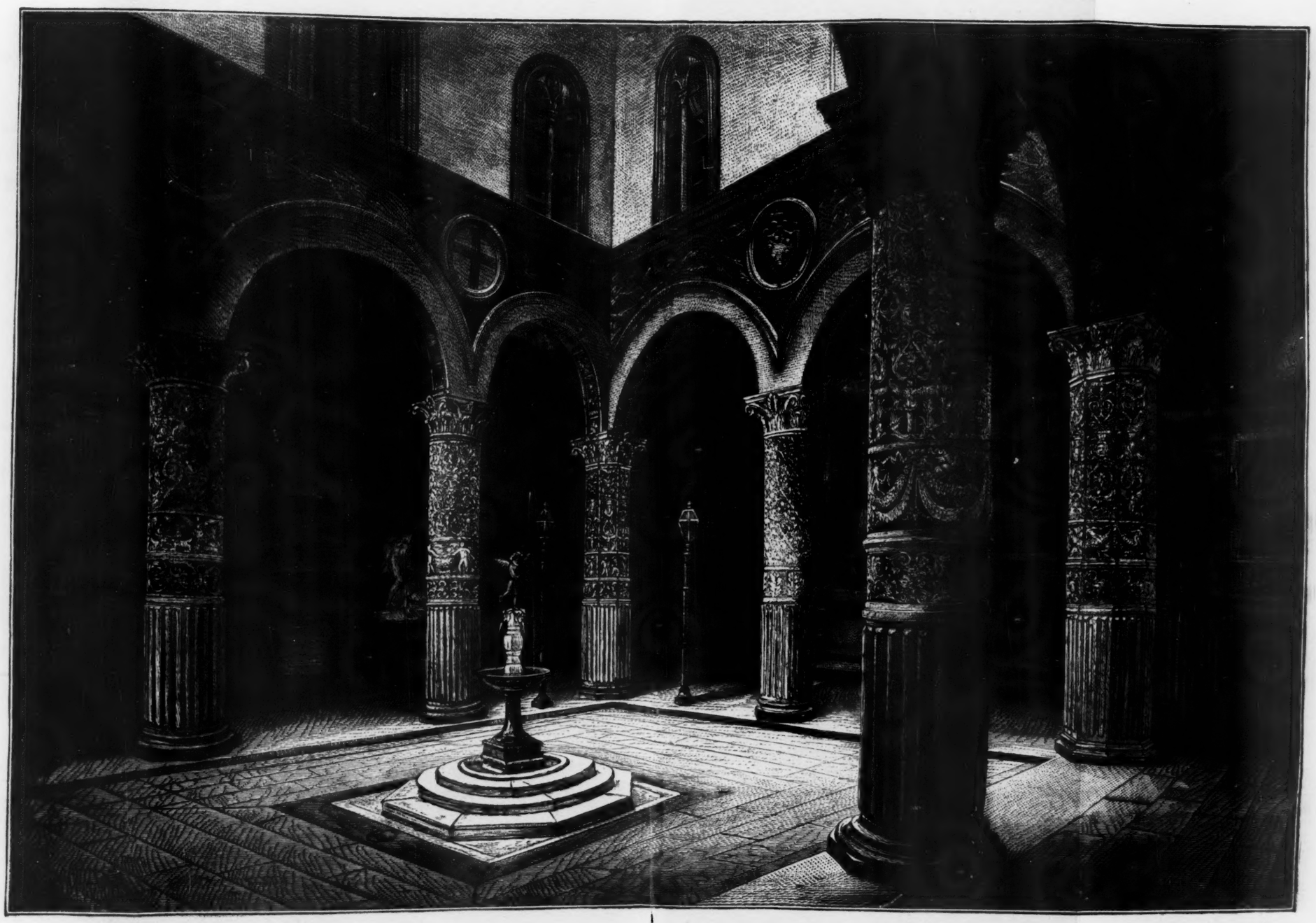
NEW CHURCH, OAKLANDS, NEW ZEALAND.—MR. H. NATHAN SMITH, ARCHITECT.

Wyman & Sons, Printers, G^t Queen S^t.

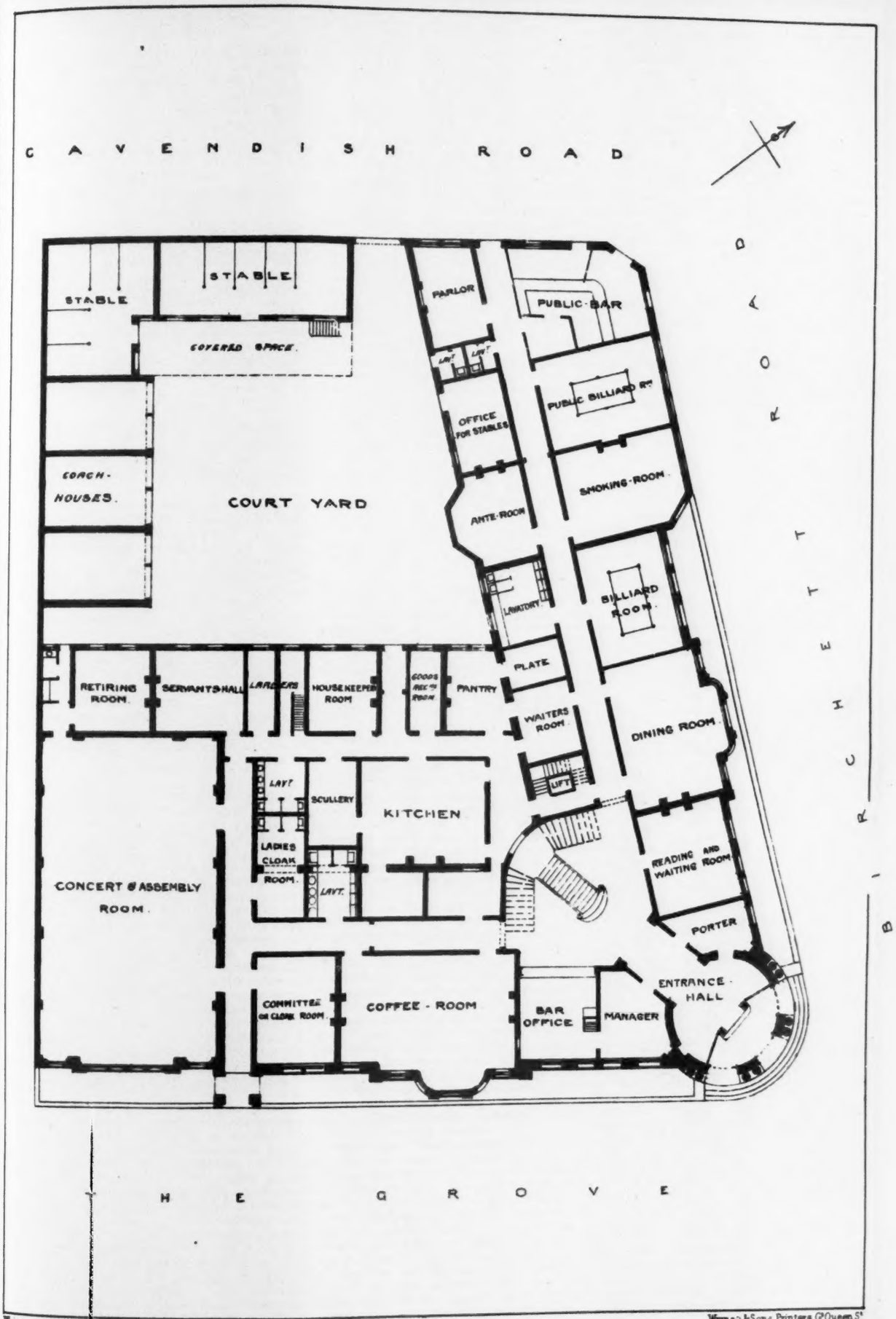
Whiteman & Bass, *Photo-Litho* 236, High Holborn.

Wyman & Sons, Printers, 74 Queen St.

PROPOSED ALDERSHOTT GRAND HOTEL.—Mr. Geo. Edwards, Architect.

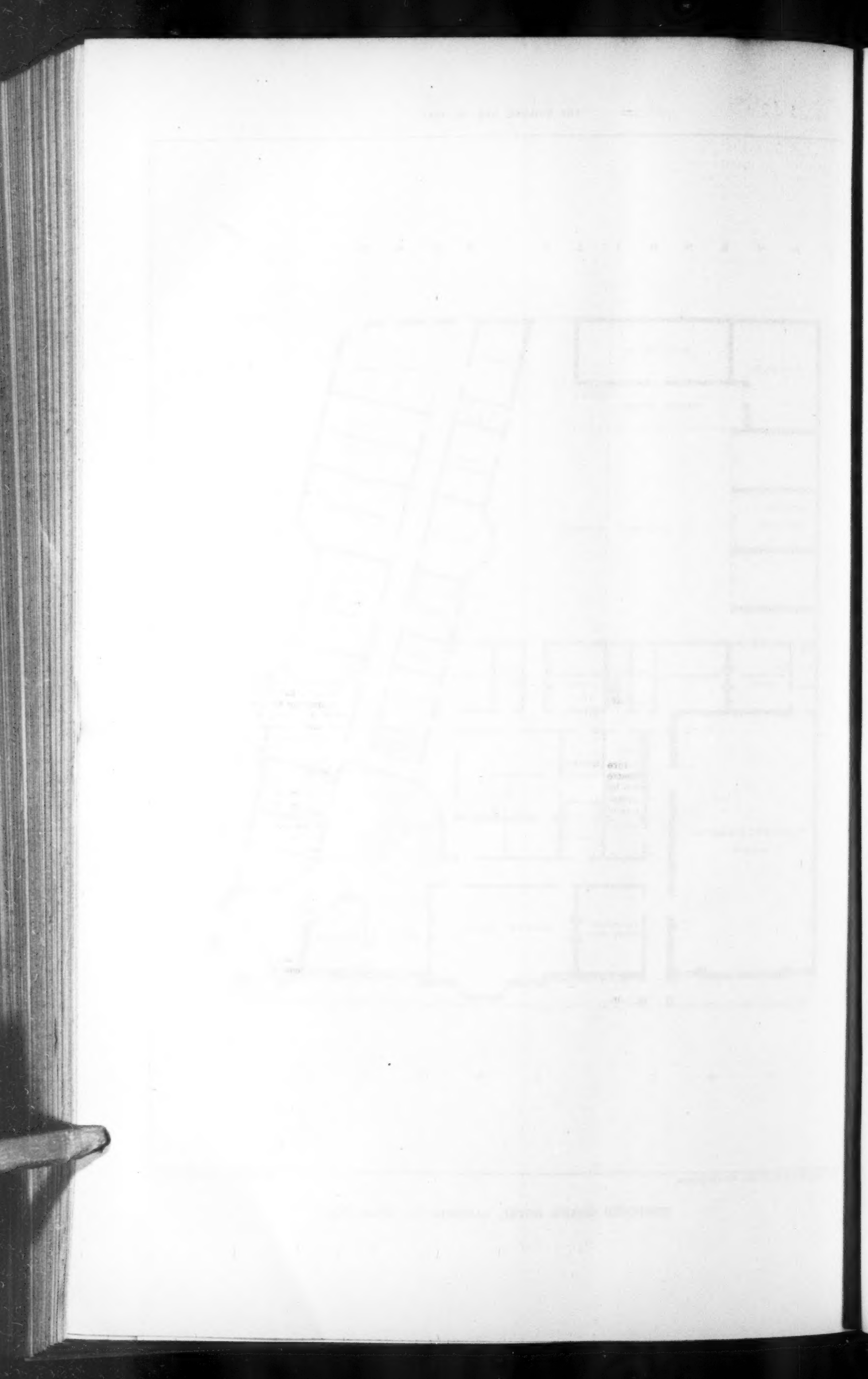


COURT OF THE "PALAZZO VECCHIO," FLORENCE.—ORNAMENTATION BY MICHELOZZO MICHELOZZI. 1391-1472.



Whiteman & Bass, *Photo-Litho* 236 High Holborn. Wyman & Sons, Printers, 74 Queen St.

PROPOSED GRAND HOTEL, ALDERSHOTT: *Ground Plan.*



NEW CHURCH, OAKLANDS, NEW ZEALAND.

THIS church will accommodate 500 adults, and is of brick, with stone dressings. The interior will be faced with red bricks, relieved by stone bands. The actual cost is not ascertained, but will be about 9,000*l*. A marble reredos will be added at a future date. The building is expected to be finished about July or August next year. Mr. H. Nathan Smith, of Manchester, is the architect.

COURT OF THE "PALAZZO VECCHIO," FLORENCE.

IN reviewing recently M. Yriarte's splendid book, "Florence," we gave several illustrations of the city. We add to these, in our present number, a view of the Court of the Old Palace. This shows it, not as it was designed by Arnolfo di Lapo, about the year 1298, but as it left the hands of Michelozzo Michellozzi, about 1434. Other decorations, including some fine frescoes, were executed on the occasion of the marriage of Francis I. and Jane of Austria, 1565. The fountain by Verocchio is a work famous in the history of sculpture.

THE ALDERSHOTT GRAND HOTEL.

THIS building is about to be erected for the Aldershott Grand Hotel Company on a corner site close to the railway station and South Camp.

The building will contain, besides the accommodation shown on the ground-plan, in the basement,—spacious wine, beer, and coal cellars, and the heating apparatus; on the first floor, suites of rooms; and drawing-room over the principal entrance. The bedrooms will be sufficient for 100 visitors, exclusive of servants. The kitchen offices are one story high, with top lights.

The style is French Renaissance; the circular corner and tower are placed to break the acute angle.

The walls are faced with red bricks; all the architectural decorations being stone, except the large pilasters above the ground-floor, which are formed in the brickwork.

Messrs. Martin, Wells, & Co., of London and Aldershott, are the general contractors; and Mr. George Edwards is the architect.

COLOUR IN ARCHITECTURE.

THIS was the subject of an interesting lecture delivered on Monday evening last in the Theatre of the London Institution, Finsbury-circus, by Mr. George Aitchison, A.R.A., who said it was almost self-evident that the first worship of beneficence must have been the worship of the sun, the source of light and warmth, and, proximately, of vegetation; while night, with its cold and darkness, was the evil deity. Each thing that added pleasure or profit to existence was an *avater* of the Great Beneficent, while the storm, the tempest, and the water-spout, the beasts of prey, the deadly snakes, the venomous insects, and the poisonous plants, were incarnations of the Evil One. When the first shrine or temple to the sun-god was made, it seems likely that those colours that were most striking or most prized were lavished on the deity or the temple; and it was dependent on the mood of the worshipper or the priest whether the same colours were lavished on the temple of the Evil Deity, or withheld; whether he was to be propitiated by having the same attentions lavished upon him as upon his rival, or whether the temple was to strike the proper awe or horror on the supplicants. It is probable that from their beauty, their brilliance, or their rarity, certain colours got appropriated exclusively to religious use, and were afterwards relegated to or seized upon by the chiefs and their families,—the imperial yellow of China, or the purple of Rome, for example. Fortunately for us, there are the traces of colour amongst the ruins of Babylon and Nineveh, and we still have the colouring of some of the temples in Egypt; but it is almost useless to speak of colour unless it has been seen by one's own eyes, and in its proper situation. That which looks crude and harsh when brought close to the eye, in full light in a climate like our own, may have the greatest richness, splendour, and harmony in its original situation, with a mighty "contiguity of shade," and under a burning sub-tropical sun. The scheme of Egyptian colouring might be described as bands and patches of brilliant colouring on a white ground. Sir Frederick Leighton, who has seen the temples of Upper Egypt, describes their effect as fairy-like, not that of a rich sustained magnificence, but like that of a flight of lovely butterflies, and he dwells particularly on the method of lighting, the sun pouring in from high aisle windows, so that the whole nave is lighted up by reflected light. That the Greeks painted their temples and statues, or at least portions of them, we know; and by some, that painting has been described as crude, garish, and vulgar; but in the case of temples we have to consider this point: Was the colouring a fair specimen of Greek taste, or was it done solely to please and attract the herd of vulgar worshippers? Mr. Watts, R.A., was with Mr. Newton when he was carrying on the excavations at Halicarnassus. A large slab, now in the British Museum, which formed a part of the tomb of Mausolus, was turned over. On its face was a wide floral border, and the whole of the ornament was painted with vermilion and golden yellow, on a ground of greenish-tinted ultramarine, and under the blazing sun Mr. Watts declared that the effect was magnificent, and his were the only cultivated eyes that ever saw it. It was carefully covered up for Mr. Newton to see on his return some few hours afterwards, but on being uncovered the whole colouring had vanished. After describing some Oriental and Italian coloured exteriors, the lecturer proceeded to consider roughly the schemes of internal decoration, of which, exclusive of stained glass, it might be said that there were only three divisions,—Firstly, the fully-coloured, where white and the very pale tones were used as jewels on a generally rich half-tone. The second scheme was that in which a white or very light-coloured ground was wholly enriched with ornament. In the third scheme a white or very light ground was only partially enriched by spots, bands, or cartouches. The effects produced would greatly vary with the materials used: greater limpidness, depth, and richness would be attained when polished marbles, glazed tiles, and mosaic were used, than when a similar effect was sought by the use of fresco or distemper, or even by the use of oil-colour. The most perfect examples of full coloured decoration which the lecturer had seen was the interior of St. Mark's, Venice. Perhaps the next most splendid example was the Under Church at Assisi, painted in fresco; while the third was probably the Council Chamber of the Doge's Palace at Venice. The Church at Subiaco, and the Arena Chapel at Padua, were fine examples. The house of the Sheik-el-Islam at Cairo was a fine example, and doubtless, if Owen Jones's restorations of the Alhambra were correct, so was the Alhambra itself. Of the wholly decorated buildings on a white ground, the lecturer could not recollect a single good example, but of the partially decorated, the Church of St. Anastasia at Verona was cited as a very perfect example. Stained glass was of itself the most perfect vehicle for the highest form of colour. It might possibly be objected that that pre-eminence belonged to painting in oil, and it was difficult to conceive anything more gorgeous than some of the colour of the masterpieces of the world; but the stained-glass windows of the twelfth and thirteenth centuries were like a glory of every lovely tone and colour that exceed imagination, like the liquefaction of every conjunction of every lovely gem. Where there was stained glass in its fullest perfection no further colour decoration was needed, though in certain rare instances it did not greatly interfere with highly coloured decoration, as was to be seen in some of the mosques at Cairo, and at the Sheik-el-Islam's house. Having referred to the plumage of birds, the lecturer expressed the hope that brilliant composers in colour might again spring up amongst our race. Colour, like music, would lend itself to any words, still, it was well to have it set "like perfect music unto noble words." From the peculiar position we were now in, mankind having but just completed an upward step in physical acquisitions, we had not yet re-learned to love the beauty of anything, so that all we could get was what some other people once thought or now think beautiful, instead of having what we love or think beautiful ourselves. In interior decoration the one great rule should be that when the eye is half closed there is but a delicate suffusion of the particular coloured tone we wish to predominate; and in any perfect system we want a small portion at least of pure white and of pure black, as a scale by which all other colours and tones may be measured; but that need not prevent us from making any deep recess or portion, that is so cut off as to make itself a separate object, a spot of brilliancy or coloured loveliness. As far as the external decoration of buildings is concerned, the lecturer was prepared to admit that greater dignity might be obtained by a light monochrome, than by any other means; and it was obvious that where great beauty of form and exquisiteness of line were required, colours were apt to draw off the attention from that which was too precious to be lost. Still, he would fain see our streets filled with houses of some more cheerful and beautiful material than dingy brick, with its patina of soot and dust. Coloured tiles and earthenware seemed to afford the means for this indulgence. For more costly buildings, polished granite, porphyry, serpentine, and bronze might be used with happy effect. All the marbles perished too rapidly in our damp atmosphere. In conclusion, the lecturer said he had longed to see the walls in our fine public buildings which were protected by porticoes adorned with splendid mosaics on a deep blue or a golden ground, as the case might be, on which some grand episode of our national history might be portrayed by some of our great artists, and their interiors also enriched by gorgeous friezes and splendid panels.

AN IDLER AT BRIGHTON.

AFTER reading the interesting account given by you last week of the Domestic and Sanitary Exhibition in this "city by the sea," I thought I would take a stroll to the Pavilion and look at it. You once did me the honour of publishing a few notes of mine on the Paris Exhibition, and I thought, therefore, your first article having entered into the more scientific part of the question, you might find a small space for the few lighter and more frivolous observations of a mere looker-on.

Having seen many exhibitions, I was prepared to be disappointed, but was agreeably surprised. Small, compact, bright, and clear,—it is a most admirable *multum in parvo*,—enough to give people not deeply learned, or who have not studied these matters much, a desire to know more, yet enough also to give the really earnest people a feeling that they can, figuratively speaking, pat it on the head and say, "Well done." It is interesting as being the largest exhibition known in this town, nearly 300 firms being exhibitors, and it has been the means of bringing home in a pleasant and easy way to the minds of a large concourse of people the various later discoveries and improvements in science. We think, though, that as the basis gone on that it is to bring all this home to the minds of the people at large, and that as to the very poor a shilling represents a large amount, two days should have been set apart ere it closed, and the rate of admission reduced to threepence.

After a glance at the various stalls and the food products, art decorations, sanitary improvements, and machinery, I could not help thinking that a bright little exhibition of this kind, which whilst it instructs amuses, opened now and then in Bethnal-green, Shoreditch, and other outlying parts of our great city, with a merely nominal entrance-fee and some entirely free days, would do more to bring home to the people certain sanitary facts, and make them understand more clearly how much depends on themselves, than a hundred mere lectures from the tongue of a lecturer, charm he never so wisely.

There is no doubt that a certain additional Government force put on landlords and builders, to compel them to see the original architectural and sanitary condition of a house is as well organised as it can be, is wanting. But even that would be of no avail, merely spelling ruin to these two classes if the inhabitants themselves are as ignorant and as dirty as the "masses" in every country generally are. And a palace with every perfected and modern improvement would soon be but an Augean stable if the inhabitants themselves be "but as the beasts that perish." It is then by making them clearly understand how much comfort, combined with saving to their own pockets, can be brought about by adopting good arrangements and inventions that philanthropists and scientific men will be best able to put their sweeping reforms in motion.

The exhibition itself is so well arranged that no time is wasted. With a courage worthy of so good a cause, and disdaining the horrors of a fit of indigestion looming in the distance, I pass from stall to stall, tasting beef in varied forms

of condensation. Some is given me as soup, steaming hot; some I take in cold water. This latter is meant to try and beat all the beef "compressists" known, four pounds of meat being reduced to an extraordinary small space. Excellent as it is, a thing may be of the earth, too earthy, and of meat, too meaty, and all condensed food to my palate is so: therefore I rush on and quaff with gratitude a glass of sparkling Ferrozodone a friendly hand holds out. I refrain from accepting another invitation to taste some excellent, they say, Curaçoa, manufactured from something that is not the real thing, though it looks like it. On every side the energetic exhibitors offer products of all sorts,—butter, wheaten bread, sweets, lime juice, &c. I pass the oysters in their tanks with a friendly nod, and still, like the busy bee gathering honey all the day from every opening flower, accept cakes of terrebene soap, the use of which I am assured will make the washee handsome or beautiful, as the case may be, for ever. The air is redolent with the jets of perfume; books, cards, &c., are (as the divine Williams says greatness sometimes is) thrust upon one. After pausing to admire the splendid potatoes raised from the seed Mr. Sutton sells, and wishing poor Ireland had sown and reaped such fruit as this instead of rebellion, bloodshed, and famine, I pass rapidly to the decorative arts. Crockery and pottery from Staffordshire and Worcester can well bear their juxtaposition with some from Austria; all are beautiful. Painting on silk, satin, tapestry, wood-carving, modelling, amongst which a mask by a young Brightonian, Mr. W. H. Caddy, is noticeable; the Lincrusta-Walton wall decoration, which bears washing; Messrs. Mayall's electric-light photography in indelible carbon; and a hundred other things, are all interesting.

In the scientific department, from every kind of machinery meant to save time and labour; from wonderful cooking apparatus, smoke-consuming stoves; from the telegraphic signalling apparatus exhibited by the Brighton Railway Company; from electricity in domestic matters (one arrangement, notably, an ingenious street fire-alarm, by which, by pulling a bell, the locality of the fire is indicated to the central fire station); from the chronograph, the first of its kind, I believe, in England, that Mr. Douglas, of Stourbridge, exhibits, which not only registers minutes and seconds, but so small a space of time as the 300th part of a minute, down to a pen, which, if you only dip it into water, writes in ink, and which is supposed to last two years; all is instructive and interesting, and we can earnestly congratulate the promoters of the Congress on the well-deserved success of their well-organised scheme.

C.

ARCHITECTURAL ASSOCIATION.

At the ordinary meeting of this Association, on the 9th inst., Mr. Aston Webb, President, in the chair, twenty-six new members were nominated.*

Mr. Cole A. Adams then read his paper on "Barnacles," the substance of which we printed last week.

In the discussion which followed,

The President said that Mr. Cole Adams had favoured the Association with a very valuable and interesting paper. With regard to the memorial on competitions, the success of which was so largely owing to the labours of Mr. Adams, it was already having a great deal of good effect by the now very frequent, if not universal, adoption by competition committees of the suggestion for the appointment of a professional referee in each case. Mr. Adams had taken a wide view of the whole architectural world, and given his opinions on its present condition. One of the points upon which he had commented was the confusion of styles which now reigned, and which all must lament. It was to be hoped that out of the confusion would arise some new and satisfactory development. During the progress of any new movement which took place, the principles which underlay it were not usually known until afterwards, and the actors in such movements were not usually the men to formulate those principles. As an instance, Turner painted his pictures, but Mr. Ruskin followed out the principles on which they were unconsciously painted. In regard to architecture, Mr. Adams recommended the system of consulting specialists. They were to be, as he (the President) understood, in the profession, though not exactly of it. He hardly saw how that would work, because a man who devoted all his attention to one speciality,—drainage, for instance,—could hardly be a full architect. Then the system of employing specialists would, if he understood it aright, be very expensive to the client; for if different men were to be employed for every speciality, such as warming, drainage, and so on, the professional remuneration would amount probably to 10 or 12 per cent. upon the outlay instead of 5 per cent. In relation to the competition question, while it was very desirable to insist on the appointment of a professional referee to report upon the designs submitted, it would greatly add to the value of the concession if the referee were appointed at the very outset, so that he might draw up the conditions.

Mr. F. H. A. Hardcastle said that Mr. Adams's paper was exceedingly well conceived, and contained a great deal of excellent matter. With regard to perspective drawings in competitions, the evil referred to seemed to have over-reached itself. Perspective drawings had been so misused and abused for competition purposes that it was very common now in competition conditions to find them expressly excluded. Now he thought that their total exclusion was to be deprecated, for it was but reasonable to recognise the fact that other people besides the professional assessor,—those, for instance (or their representatives), who find the money for the buildings,—had an interest in seeing what the proposed buildings would be like. It was only from a perspective drawing that a non-professional person could judge of the appearance of a proposed building, and therefore, if the perspective view was fairly and honestly drawn, and was not a purely fictitious affair, it would form a very valuable and important part of a set of competition drawings. As to specialists, they were already employed in some directions. Sometimes when an architect had a large building to erect he had a somewhat hazy idea of how he was going to construct his ironwork, and he went to a specialist and said, "Here are my plans and drawings; look at them and tell me what girders should be put in, and what you will do them for, and I will include your price as a provisional sum in the contract." That was a perfectly straightforward method, and it had its advantages, and it did not take out of the architect's commission a fee for the work. If, however, the architect called upon a consulting engineer for advice as to what he was to do, he must either pay him out of his own pocket, or must contrive to include his fee in the charges for lithography of the specification, or something of that sort, which of course would not be a straightforward and satisfactory course to pursue. Mr. Adams's remarks upon sanitary science, although they followed the line of observations which had been frequently made before, it would be impossible too often to repeat or too strongly to insist upon. It was perfectly certain now that the profession must be alive to the fact that people who employ architects often know a great deal about science. Science during the last twenty years had become so generally a subject of study with every decently-educated person that if an architect did not know anything about sanitary science he would be likely to find his client greatly shocked at discovering that his (the client's) knowledge of the subject was greater than that of his skilled professional adviser. As to the unfortunate speculating builders who were responsible for so much bad work, and who were sometimes blamed for a great deal more than should be laid to their charge, he was very glad to hear Mr. Adams's allusion to the ground landlords, for undoubtedly one great reason why we had such miserably-constructed houses was the short-lease system. How on earth could it be expected that a man should incur the cost of erecting a house capable of lasting for two or three hundred years upon land leased to him for only eighty or ninety years? As long as the pernicious system of short leases continued, so long would the houses of the masses of the people continue to be run up in the flimsy and depressing style which was so much to be deplored.

Mr. Sydney Vacher, in proposing a vote of thanks to Mr. Adams for his paper, said that a great deal had been said about the necessity of resorting to specialists, but specialists not only existed, but were largely resorted to. A specialist for writing a specification, when the architect was busy, was the quantity surveyor. For heating, ventilation, fire-proof construction, &c, architects took the advice of firms who had made those subjects their special study and business, and who could not only give advice, but carry out the work, with, perhaps, a "fad" or two introduced by the architect, which might (or might not) be improvements. In his opinion, to resort to practical trade specialists was generally sufficient. As to perspectives in competitions, in one or two competitions recently given, the picture line had been given for the perspective, but in his opinion it would be preferable to give the line of sight.

Mr. Hampden W. Pratt, in seconding Mr. Vacher's proposition, said he thought the Association was very much indebted to Mr. Adams for his encouraging paper, the keynote of which seemed to be that if architects were to be worthy of the name they must be thoroughly in earnest in striving to do all their work well. With regard to sketches made during travel, he thought with Mr. Adams that they would be all the more valuable and useful if dotted with "barnacles" in the form of figured dimensions. Mr. Adams's observations about speculating builders were very suggestive, and seemed to show that the responsibility for the bad building of the houses of the people did not rest so much upon architects as Mr. Street implied. Touching the question of competitions, the preliminary sketch competition system seemed to have many "barnacles" attaching to it. If the double-competition system was going to be generally adopted, it was not desirable to make the competitors go over a great deal of the ground twice, and if it were to be insisted upon that a competitor must not, in the second competition, deviate in any perceptible degree from the design submitted by him in the preliminary competition, the system would work its own death. When there was a preliminary competition, very little work, compared with what would be necessary in the second competition, should be required.

Mr. Charles Smith, in supporting the motion, said there was a good deal of common-sense in the remark that clients nowadays appreciated science a great deal more than they did. There might be some architects who could with impunity neglect to give due attention to the sanitary details connected with building, because they might have a numerous *clientèle* who employed them for other matters, but no young architect would find that it would pay him to neglect sanitary science, and he was very pleased that Mr. Adams had so vigorously hammered in that truth. As to the employment of specialists, everybody knew that there was a great deal of specialism involved in the working out of any contract, especially for a large building, and it seemed to him that the tendency towards specialism in building must increase as time went on, and as the wants of the public became more complex. He had been very much amused with an article which appeared in the *Spectator* a few weeks ago, in which the writer suggested that the builder of a house should be made responsible for everything connected with it, he employing the architect among other specialists whose services would be required in its erection. He had heard that idea broached by men thoroughly interested in the progress of art, and he had even heard it suggested that in architecture one man should make the plan and the other should clothe it in an artistic garb in the form of architecture. It was, in fact, deducible from experience that many architects who were thoroughly wrapped up in art-matters were not sound in planning; while, on the other hand, there were many good schemers in planning who were nowhere in art matters. When a man combined the two faculties, skill in planning and excellence in design, the result, of course, would be more satisfactory than could be achieved by a division of the work between two persons.

The vote of thanks having been passed,

Mr. Adams, in replying on some points raised in the course of the discussion, said that his

* At the previous meeting sixty-two members were elected, viz., Messrs. M. Collins, C. S. Cornish, F. Ward, F. W. Lane, A. E. S. Whitelock, F. A. Dry, F. A. R. Willey, J. N. Hamilton, S. H. Davies, G. H. Oakley, L. Dawson, F. A. Huntley, F. Macey, J. E. Newbery, W. R. Lawrence, W. Duffett, C. Turner, R. Kershaw, A. O. Broads, C. J. Clark, P. J. Byrne, F. E. Macey, J. J. Wood, F. J. Webb, C. S. Meadway, B. Potter, N. J. Stanger, G. G. Wallace, P. H. Watson, C. T. Moxon, E. J. Stow, E. P. Tucker, L. Lunn, J. Shepherdson, W. G. Roberts, G. E. Holman, C. R. H. Tyndall, G. P. K. Young, H. C. Chevalier, R. W. Paul, W. R. Crewe, A. G. Griffith, H. W. Wills, J. M. Hatfield, R. J. Thomson, E. H. Dance, W. C. Rea, V. E. Bigsby, E. D. Hoyland, P. Brown, C. J. Knight, H. O. Jackson, F. L. Sweet, T. E. Pryce, H. C. Brushfield, J. M. Keith, W. H. Closson, A. Turner, J. I. Murray, J. C. Waghorn, W. E. Symington, and W. A. Alderton.

views on the subject of the employment of specialists had been somewhat misunderstood. What he proposed would not materially add to the cost of building. He presumed that an architect having a large building to erect, and finding himself not sufficiently conversant with some particular subjects, would find it advantageous to consult some other gentleman who, while being an architect in general practice, was known to have given attention to some one particular branch of his profession. To take the subject of drainage, for instance. Within the last year Mr. E. C. Robins and Mr. Ernest Turner had read admirable papers on the subject of house sanitation, to which subject it was known they had given special attention. Suppose, on a matter connected with warming, ventilation, or drainage, an architect wanted information which it was no doubt in the power of one or the other of those gentlemen to give, why should he not consult them, paying them a fee of a guinea or two for their advice, just in the same way as medical and surgical practitioners consulted physicians and surgeons of larger experience than themselves? If such a course were to be generally pursued, it would prevent a great deal of the architect's own proper work drifting out of the profession into other hands. With regard to other subjects, such, for instance, as colour decoration, architects known to excel in that subject might be consulted in the same way, instead of going to Mr. So-and-so, the painter and decorator. Where more than mere advice on any particular part of the work was needed, some system of sharing the commission on the cost of the work could surely be arranged between the parties. When he spoke of specialists, he did not mean those specialists who were tradesmen, for of course they would recommend nothing but their own appliances, materials, and schemes. As to perspectives in competitions, there could, of course, be no objection to them if they were honestly made, as suggested by Mr. Vacher, from one point of sight. With regard to iron-girder work, it was a common thing for an architect to go to an engineer for advice, and he thought that the architect was wise in so doing, although the idea was entertained by some people that it was a dreadful thing that an architect should not be a thorough master of constructive iron-work. Surely, seeing that the subject was one which took almost a lifetime to thoroughly master, the architect, who had to give his mind to so many matters, might be excused if he called in competent professional advice rather than risk the safety of his building? As to Mr. Smith's observations about the powers required in planning and design, he thought it was the late Professor Cockerell who advised that, at any rate in every important building, two architects should be employed, one to make the plan, and the other to design the elevation. Unfortunately, many young architects were apt to think lightly of planning, but, rightly considered, the plan was the *alpha* and *omega* of all good art in building.

The meeting then terminated.

ENGINEERING WORKS PROJECTED AND IN PROGRESS.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THE inaugural address was delivered by the president, Mr. A. T. Walmisley, on the 8th inst. First sketching the history and progress of the Society, the writer treated of the position and duties of the profession, passing thence to a notice of works now in progress. We print the latter half of the paper:—

It is now about fifty years since electricity may be said to have become just ripe for adaptation to practical purposes, and was much developed by the experiments of Faraday and Wheatstone. In 1838, the first telegraph line from Paddington to West Drayton on the Great Western Railway was set up, and so universal is its present application that even the interior of the great continent of Australia is now crossed by the electric telegraph. Among various applications of electricity to motive power may be mentioned the propulsion of trains by currents passing through the rails. The recent Paris Electrical Exhibition demonstrated the progress made in all branches of electricity, and particularly in its application to railway work. A curious experiment in engineering will be the execution of the proposed plan of Mr. Maxim, of New York, for the drainage by electricity of the basin around the city of Mexico, to do which a company has been formed, the funds raised, and the contracts signed. The plan in brief is to establish on the western slope of the mountains, where the fall is great and rapid, a number of water-wheels sufficient to develop some 20,000 horse-power, and make them drive dynamo-electric machines of high electro-motive power. The current from these machines is to be conducted about twenty miles to a set of electric motors placed on the margin of the lake, and driving pumps which will require about 7,000 horse-power to work them. The water has to be raised about 40 ft. to clear the ridge, but once raised it has an uninterrupted fall toward the Pacific of several thousand feet, so that the descending water is made to keep up the work. The whole apparatus constitutes what Mr. Maxim calls an "electric syphon." The plan will (says the New York *Iron Age*), it is believed, succeed, and thus relieve Mexico from the inundations that have damaged it so much for several centuries.

The Naval and Submarine Engineering Exhibition, to be held next April at the Agricultural Hall, is being well supported, and will doubtless be productive of much good. The exhibits will consist of machinery and mechanical contrivances employed in or connected with the construction and equipment of ships, docks, harbours, forts, and the like, and the value of the exhibition will be increased by lectures on naval architecture which will be given. In the designing, construction, equipment, and working of our fleets the foremost talent is engaged, and upon it the highest mechanical skill is employed, and the prizes to be offered will doubtless act as an incentive to many inventors to make known their ideas. The great progress made of late years in marine engineering is due to the continual competition between rival lines, thus necessitating economy of working by developing the largest amount of power out of the smallest quantity of fuel, so as to leave more room for cargo. Great Britain has now over half the sea-carrying trade of the world, and the great increase of length in modern vessels necessitates in many cases either the enlargement of old, or the construction of new, docks. This great enlargement of our dock accommodation is a feature of no small importance as regards the industrial progress of England,—at Leith, at Liverpool, at Folkestone, at Swansea, at Cardiff, at Milford, at Hull, and Penzance, in addition to other places on the coast. London herself has now special plans under consideration. The construction of the Victoria Docks provides an entrance lower down stream, where the navigation is less impeded. New docks are also in contemplation at Dagenham and Tilbury, with the object of avoiding the navigation of the somewhat circuitous reaches above Gravesend. The Act of Parliament for the Dagenham Dock was obtained last session, Messrs. Bell & Miller being the joint engineers, and Mr. James Abernethy, President Inst. C.E., the consulting engineer. The Tilbury Dock scheme is promoted by the East and West India Dock Company, and though not much more than one-third that of the docks at Dagenham in water area, it will, when carried out, possess the great advantage of a very large quay area and quay wall length. Plans have been deposited to accompany a Bill for next session, under the direction of Mr. Manning, the company's engineer, and Mr. Ahlfeldt, the manager of the Millwall Extension and East and West India Dock Company's railways. The site selected is at the natural entry of the Port of London, on the west side of Tilbury Station, opposite Gravesend, and the scheme is designed to meet and accommodate to the fullest extent the large steamships engaged in the East India, China, Colonial, and American trades, and will be capable of docking the biggest vessel afloat, except the Great Eastern. It will be essentially a railway dock, having lines running along the jetties connected with the Tilbury system, and laid with easy curves, and without turntables, so as to expedite the rapid handling of the immense railway traffic, which must necessarily pass over the Tilbury line into these docks. The junctions at Barking, Bromley, and Bow place the whole of the Tilbury Railway system in connexion with the great trunk lines of the kingdom, and the dock traffic will thus be enabled to pass by less conjested routes than those serving other dock undertakings. Ample shed roofing will be provided, a large quantity of grain and food stuffs having to be dealt with, which has now become such a prominent feature it the importations of this country, and the East and West India Dock Company will be enabled to maintain their supremacy in the chief port of the United Kingdom. It is proposed to construct two graving docks of about 900 ft. in length, with a sill 27 ft. below high-water mark, thus ensuring the reception at any time into dry dock of the largest American vessels. The *City of Rome* is 585 ft. long, 52 ft. beam, and 26 ft. draught, and is the largest vessel afloat, except the *Great Eastern*. The *Orient* is 470 ft. long, 46 ft. beam, and draws 26 ft. 6 in. when very heavily laden. The new deep-water docks at Tilbury will thus be seen to be capable of docking any vessel that can pass into New York, where the draught is limited to 26 ft. The new graving-docks will be capable of sub-division by caissons sliding in grooves, so as to dock two or more vessels in separate compartments as may be required. The quay berthing accommodation will be over 15,000 ft. in length, with a uniform depth of 35 ft. of water throughout, and thus there will be no necessity to remove a vessel of the greatest capacity and draught for the completion of her loading, to the outer or tidal basin, the sixteen acres of which, with a depth of 41 ft. at high-water spring tides and 26 ft. at the lowest time of the tide, will be exclusively available for the direct entrance or departure, at any moment, of the largest class of ocean-going vessels now in existence or likely to be constructed, after the experience of the *Great Eastern*. The Port of London will thus cease entirely to be on the same footing as the other great commercial ports round the coast, the approaches to many of which are by tidal rivers, having shallow bars or with insufficient depth of water in their navigable channels at low tide, to admit of the reception and departure of vessels of the type enumerated, except at or about the time of high-water. Much has been done of late years in floating docks. Hydraulic docks, with floating pontoons exist at Bombay, Malta, and the Victoria Docks, London, and a new dock on Messrs. Clark & Standfield's system, is now being constructed at Barrow for the Furness Railway Company, which will be entirely a floating dock capable of accommodating vessels of nearly 3,200 tons displacement, not only raising them out of the water, but placing them, if desired, on fixed staging erected along the shore. One peculiarity in the construction is that the dock can be divided equally into two parts, each provided with its own engine, pumps, &c., so that each half can be used as a separate independent dock for smaller vessels, and can also be employed to raise the other half, so that every part of the dock is accessible for painting and cleaning.

Competition between railway companies is good, and preserves the public against limited accommodation, high rates, and imperfect service. Our leading companies have recently seen the advantage of separating the goods traffic lines from the passenger traffic line as much as possible. The widening of the London and North-Western Railway system at Liverpool is about to be followed at Birmingham, where it is proposed to throw the approach tunnel leading into New-street Station into open cutting, and to construct four lines of rails instead of two. The Great Northern Railway are about to widen their line between Hornsey and Potter's Bar, and similar widenings and extensions are going on in various parts of the country. Though all the main lines of the kingdom may be said to be constructed, a great deal remains to be done in the way of loop-lines and junctions, so as to effect a better connexion between our existing systems; for instance, to quote a case near home, all the goods traffic between the North-Western Railway and the South-Eastern Railway has, for want of direct railway communication, to be carted across London in wagons.

As regards metropolitan Parliamentary work there are more independent schemes proposed for next session than have been brought forward in any single session since the great railway years. There are 131 plans deposited for railways, twenty-seven plans for tramways, and eighty-three miscellaneous schemes, in addition to sixty-nine plans in connexion with Provisional Orders. The 14th of January will, however, test a great many, when, according to the Standing Orders, the usual five per cent. upon the amount of the estimate has to be deposited in the Court of Chancery. Among the schemes submitted are two Bills to improve the communication by railway to Waterloo Station. An Electric Railway is proposed to be made by a

new company leading from the north-west end of Northumberland Avenue, and running to within 9 yards of the arch of the loop-line of the South-Western Railway in Vine-street, York-road. Another scheme proposes to connect Waterloo Station with the City by a railway terminating near the Mansion House Station, on the west side of Queen-street, in Cannon-street. On the Surrey side, the connexion with the South-Western Railway is proposed to be formed by lines leading direct out of the station, and also by a curved loop-line entirely outside to enable trains to run through without entering either of Waterloo Stations. The London and South-Western Railway Company ought long ago to have run on to Charing-cross and Cannon-street rather than allow the South-Eastern Railway Company to have made this branch. A useful junction is made between the London, Chatham, and Dover Railway and the South-Eastern Railway on the north-east side of the latter line, enabling trains to run on from the north of London and Holloway to Woolwich, and a similar curve might easily be constructed on the south-west side, forming a junction between the South-Eastern and London, Chatham, and Dover Railway lines, which would enable the London, Chatham, and Dover Railway passengers to run on to Charing-cross. The plans connected with the proposed Metropolitan Outer Circle Railway as deposited, show various junctions by means of which it is contemplated to connect Ealing and other places in Middlesex, with Barking and other places in Essex, by a north-east route, running powers over the necessary existing lines being sought for. Another scheme, bearing the title of the Mid-Metropolitan Railway, proposes to form a railway to be worked on the pneumatic principle, commencing by a junction with the West London Junction Railway at Hammersmith, and running to near the Minories at Whitechapel; also another pneumatic line from the Exhibition-road to Park-lane, and another from Clarendon-place, Uxbridge-road, to Bridge-street, Westminster. Plans are also deposited for a railway in connexion with the Channel Tunnel, which is making fair progress. This Channel tunnel is not yet taken up by the Government officially, but the Board of Trade will, no doubt, watch the proceedings; for, as forming a link between the two realms, the proprietary rights of the constructors should be clearly limited. It is, however, only fair to the shareholder that the legal aspect of the question should be definitely settled, in order that their interest may not suffer with the realisation of the project.

Among various schemes suggested, a central station has been proposed for London; but I doubt very much if it would answer as such. The Post-office find that district offices can be better worked than one large central office; and if this is so in the case of letters, it certainly will be so in the case of people.

Railways have hitherto been the means of employing a larger number of civil engineers than any other branch of the profession. The population of our large towns and cities is increasing daily and a large field lies open in connexion with drainage and water supply. Where sufficient land can be obtained sewage irrigation is undoubtedly the very best way of dealing with it, but it needs to be managed in a proper manner, the object being utilisation and not mere convenient disposal. Where land cannot be obtained suitable, the aid of chemistry may be called in, but it is best to avoid chemical means as much as possible on account of the annual expenditure needed to maintain the works in good order. Pure air and unpolluted water are indispensable essentials to health and happiness: hence the importance of strict attention to sanitary matters cannot be over-estimated.

Time will not permit me to do more than allude to the proposed new Tay Bridge and the Forth Bridge. The Tay Bridge will be built about 60 ft. west of the old bridge and will be nearly two miles long. The spans will be 85 in number, and the level of the under members of the girders, 11 ft. lower than in the late Sir Thomas Bouch's work. The future Forth Bridge is to be a continuous girder bridge of varying depth. There are to be two spans of 1,700 ft. and two spans of 600 ft.; the depth of the proposed girder will be 330 ft. over the piers and 55 ft. in the centre. The bridge is designed to take a rolling load of 1,700 tons on each line as compared with 600 tons in Sir Thomas Bouch's design. Bouch's bridge was calculated to sustain 10 lb. per square foot wind pressure; in the new design no part of the bridge would be blown over or any member permanently injured with a wind pressure of 112 lb. We shall probably have an opportunity to allude to these structures further in our discussions during the session.

In conclusion, let me address to our new members a few words on the use of note-making for the preparation of a paper. The value of note-making can scarcely be exaggerated, but it is necessary to bestow great care upon each fact collected in its individuality of source and bearing, otherwise the caustic criticism of Dr. Johnson will be applicable that "they were neither meat, drink, nor good talk." Observe and record, but remember that to be useful an engineer's note-book must be clear, concise, and well-illustrated with sketches of details. A good index is also indispensable. Much as Molesworth's "Pocket-book of Engineering Formulæ" is used, it is very difficult to find what one wants from the Index. I, for one, attach great importance to note-making, and consider a note-book and pencil as essential to carry in the pocket as a 2-ft. rule. In writing a paper or a report upon any subject, it is impossible to do it justice without some precedent or allusion to similar cases, and this is furnished by the note-book. It has been well said that "great effects are produced, not by the effort of the moment, but by the preparation of past moments," and what I am now simply urging upon those members who have not already tried the experiment is preparation by the collection of material, which, judiciously made, is certain to prove useful in a professional career.

It is not easy to give a written description of any engineering work. One may readily write down thoughts as they occur, but the difficulty is to arrange them together for the illustration of a principle. I have known many men able to execute work efficiently who could describe their plan most intelligibly in ordinary conversation, and yet who would utterly fail in writing a paper or addressing a meeting. Notwithstanding this, I am of opinion that those who write as well as read upon any subject are those who acquire the most perfect knowledge of any art or science, and the very best way to find out our own deficiencies is to write about the subject. A paper to give rise to a good discussion must be no mere collection of separate disjointed thoughts, like the recipes in a cookery-book. It must be no perfunctory composition, but display consideration, thought, and be practically suggestive. It should not attempt to exhaust the subject of its title, but simply to introduce it, supplying, as it were, the right key-notes for discussion, and leaving the variations to be taken up by the meeting. Considering that we award no premiums, as in other societies, our list of papers is certainly a matter of congratulation:—

Railway Working and Management, H. Mitchell Whitley, A.M.I.C.E.; Differential Tides, James Love, F.R.A.S., F.G.S.; Foundations, William C. Street, A.R.I.B.A.; Practical Ironwork, R. E. Middleton, A.M.I.C.E.; Water Fittings, M. A. Pollard Urquhart; The Air within our Dwellings, Professor Kerr, F.R.I.B.A.; A Visit to the Birmingham Sewage Works, Thomas Cole, A.M.I.C.E.; Statistics of Railway Travelling and Tonnage in 1880, B. Haughton; The Necessity for increasing the Dimensions of our Docks, R. Nelson Boyd; The Berlin Metropolitan Railway, William Bird.

NORTHERN IRON TRADE IN 1881.

The facts are now obtainable from which there may be formed an idea of the value and the volume of the Northern iron trade during 1881. Not the least interesting of these facts are those that point to the value of the product,—to the prices that have been obtained for it is in a very great degree to this that the extent of production is due. In the crude iron trade of the Cleveland district, the official facts show that a declension in price continued throughout the first three-quarters of the year. The realised price for the first quarter was 2*l.* 0*s.* 2*d.* per ton, that for the second quarter 1*l.* 18*s.* 2*d.* per ton, that for the third quarter 1*l.* 16*s.* 9*d.*, and though that for the last quarter will not be declared for some time, it is probable that it will show an increase in the price on the whole. Generally speaking, the prices of iron of other kinds has varied in a somewhat similar way throughout the year, and this indicates, in great degree, the position that the trade, as a whole, has been in throughout the year. In the first seven or eight months the market was falling, and orders were in consequence kept back as long as possible, with a consequential decrease in the prices of iron, and an increase in the stocks in the hands of the makers. In the last quarter of the year, the attitude of the makers, and the reduction in the output of Cleveland iron, changed the position, and with the probability of a decrease in stocks that has been since demonstrated true, the market felt an impetus, and prices rose with rapidity to the point that the year commenced with. And in the last month, when the operation of the restriction of the output and the fuller demand were felt, stocks showed so marked a declension that the price again rose, and it is probable that at the close of the year it will be above that of the beginning.

Prominent in the features of the year has been the collapse of the demand for crude iron for the United States. Last year there was the pouring in from the North of England of large quantities to America; this year there has been little or none sent there direct from the Cleveland district. But in the meantime there has been a clearance of the stocks of imported iron that had accumulated at the ports of importation west of the Atlantic, and prices of Cleveland iron having risen there, it is probable that there will be a not inconsiderable export of crude iron thence in the course of a few months. There has, however, to the district been a counterbalance in another part of the American demand,—that for steel rails. The demand for steel for the United States in the shape of blooms and of rails has been so great that the local consumption of crude iron in the manufacture has been far above that of the quantity sent last year as pig-iron. Hence the demand from the United States has done much to steady the trade as a whole, and has given much of a demand that has kept up the output at the highest rate, and given a large increase over that of the past year. In 1880 there were produced over 2,500,000 tons of pig-iron of all kinds in the Cleveland district; in 1881 it is certain that the production will in the total be over 2,600,000 tons. But the increase is almost entirely in the production of iron for use in the steel manufacture,—iron, that is, mainly produced from ores imported from Spain, Carthagena, &c. The largeness of the production of this class of iron in the Cleveland and Durham district is one of the features of the age, as showing that in that great district, surrounded by its own ores, it has been needful to turn furnaces to the production of over 600,000 tons of iron from ores brought long distances. This, and that restriction of the production of pig-iron that has been so much condemned on economical grounds, but which seems to have been successful in its operation,—these have been the chief features that have marked the history of the Cleveland iron trade in its first producing branch.

In the manufactured iron trade the fluctuation in prices has been less, whilst the production has been very considerably enlarged. This branch of the trade has now fully overcome the effects of the decay in the iron rail manufacture. It has substituted for it the production of ship-building iron, and this to an extent that the total production of finished iron in the north of England is now nearly equal to what it was when the trade was at its briskest and had the rail-trade in addition to the branches that survive. It is to the growth of the demand for ship-building iron that the improvement is due, and the fact that briskness rules in the shipyards, and that freights are tolerably good, leads to the belief that the activity will continue for some time, and that the iron trade, as a whole, will feel the prolongation of the benefit that it has felt for the past year. That demand has enabled the plate-makers to maintain prices that are on the whole profitable, and has one by one brought nearly all the finishing ironworks of the north into operation after a continued period of dulness. The local demand for shipbuilding iron has, indeed, been one of the chief supports of the iron trade, for it is believed that the plate and angle mills in Durham and on its borders will have this year consumed the bulk of 800,000 tons of pig-iron; so that, except the shipments to other districts, they have been the largest users of the Cleveland pig-iron. The year, then, has seen the iron trade of the North placed on a firmer foundation; prices that, at the middle of the year, owing to the heavy stocks, were only occasionally remunerative, are now generally

profitable. The production, if not at its highest point, is very large, and the present demand is shown by declension in the stocks in the hands of the makers to be above it, so that the trade will enter the new year with brighter and brightening prospects, that must, as the facilities of production are increasingly used, be reflected on the prices, and, by the operation of the sliding scales, on the wages of the workmen; and by means of an increased circulation of money, must contribute to the general trade improvement.

THE AMSTERDAM ARCHITECTS.

THE Netherlands Society for the Promotion of Architectural Art, which has its head-quarters at Amsterdam, has invited an international competition for plans for a new architects' club-house. The conditions prescribe that ground-plans shall be in the proportion of 1 to 200; sections and views, 1 to 100; and external and internal details, 1 to 10. The prizes are the gold, silver, and bronze medals of the Society, together with premiums of 42*l.* 10*s.*, 25*l.* 10*s.*, and 8*l.* 10*s.* respectively. The jury is to consist of three foreign and four Dutch architects. The date for sending in the plans expires on May 1st, 1882. M. C. F. J. L. Rieber, the secretary, 2, Wyde Kapelsteeg, Amsterdam, will supply applicants with the programme of the competition.

PROPOSED REVISION OF METROPOLITAN BUILDINGS ACT.

SIR,—I am induced to trouble you with another letter, as a suggestion is made in your pages to alter the existing provision as to the capacity of buildings by enlarging the cubic area allowed by the present Act. I am inclined to question the wisdom of this suggestion, as the objection to the present limit could be better overcome without increasing the risk.

What I recommend is to legalise horizontal party structures of a specified construction, such as concrete and iron, the iron in all cases being either embedded wholly in the concrete or encased in terra-cotta or other fire-resisting material. Each floor or space so enclosed to be allowed to contain the present stipulated area, and all communications between such areas as staircases, lifts, &c., to be enclosed by cavity and continuous walls, with double iron doors to the apertures of communication, the whole of the construction being of fireproof material. This, I contend, would meet all the requirements, and, while allowing larger spaces under one roof without lateral divisions, which constitute the chief objection to the present law, would not extend the area exposed to danger from fire. The security from spread of fire in such construction was recently fully demonstrated in the case of the Haymarket Stores. I had a case in my own experience some time ago, in which the subdivision vertically by two party walls was very undesirable. I therefore formed the whole basement (being below the street-level) of vaults, with brick arches, enclosing the stone staircase to the ground-floor with brick walls, with double iron doors to the basement, thus reducing the area above, so as to require only one vertical party wall. This, after the building was erected, was objected to by the district surveyor as illegal; but the magistrate, being appealed to, decided in my favour, on the plea raised that vaults were excluded from the computation of area, and the matter was not carried further.

Here, again, another anomaly exists in the present Act, for flats or separate dwellings can be constructed as I suggest, only they must be separately approached by an open fireproof staircase from the street, and I fail to see any more security in such a separate outward approach than in a fireproof enclosed one such as I suggest. The revision of the Act as I suggest would, I contend, meet all objections without the risk of extending the ravages of fire, as would be the case were the present allowed area to be increased.

While writing, there is a point under the Metropolitan Management Act to which I should also like to call attention, viz., the control of the Metropolitan Board of Works over projections from the line of house-fronts in existing thoroughfares. This should be restricted within certain defined limits, say, within 10 ft. or 15 ft. of the footway; for it appears to me to be a great hardship and an unnecessary interference with the rights of owners to exercise any restriction beyond some such limit.

We will take a case where the houses were originally set back 50 ft. or so from the roadway, the gardens being formed in front of the houses. The thoroughfare having become urban, vegetation does not thrive, and the character of the houses has changed. The original leases expire, and it is necessary to rebuild the houses as the leases fall in. Is it just? It certainly is not consistent to say, "As you have once set up a frontage line, and cannot vary it, however the circumstances may differ, even if the adjoining owners raise no objection, you must perpetuate as an eyesore that which was originally intended for an ornament, as a garden.' The width of new streets is prescribed, and if the old street is of the proper width fixed for a new street, 10 ft. more on either side, given to the public, is surely a sufficient concession, and would barely meet the justice of the case, in my opinion.

THOMAS HARRIS.

COMPETITIONS.

The Proposed Statuary for Blackfriars Bridge. At the meeting of the Court of Common Council on the 15th inst., the Bridge House Estates Committee presented a report on the reference of July 1st, 1880, instructing them to obtain, by public competition, designs, which shall be the absolute property of the Corporation, at an expense, by the way of premiums, of a sum not exceeding 1,000*l.*, it being desirable that Blackfriars Bridge be completed in accordance with the designs and provisions of the engineer, by the addition of appropriate groups of statuary to be placed upon the pedestals provided for that purpose at the extremities of the bridge. The committee having advertised, forty-nine designs were sent in, and referred to Sir Frederick Leighton (President of the Royal Academy), Mr. W. C. Marshall, R.A., Mr. G. F. Watts, R.A., and the City Architect, to make a selection therefrom, and they had laid laid before them a letter from Sir Frederick Leighton to Mr. Comptroller, which they submitted for the consideration of the Court.

The letter stated that the committee of award had inspected the models on two separate occasions, and had selected the six in which in varying degrees appropriateness and talent were best combined. But they were not prepared, in view of the great importance of the work, and the high gifts required for its adequate and satisfactory performance, and in view also of the calamitous results of failure, to recommend the execution on a large scale of any of the designs submitted to them, or the employment of the competing artists in the preparation of other designs with a view to their execution. But whilst they had with unfeigned regret arrived at this conclusion, they unanimously pressed on the Bridge House Committee the importance of not yielding to discouragement at the failure of a competition in which so much of the best ability of the country took no part, and of seeking now through some other channel to achieve, or at least to partially accomplish, the great object for the fulfilment of which the competition was instituted. The committee recommended that premiums of from 100*l.* to 250*l.* be given for the six best designs, the designs to become the property of the Corporation, and that it be referred back for the committee to consider the best means of carrying out the order of the Court relative to the placing of statuary on Blackfriars Bridge.

Mr. Bedford moved the adoption of the report, which was agreed to.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,276. J. Teer, Salford. Fire-grates. Dec. 2, 1881.

5,279. T. Ivory, Edinburgh. Gas-cooking stoves. Dec. 2, 1881.

5,294. E. Kaulbach, London. Smoke-consuming furnaces, &c. Dec. 3, 1881.

5,299. H. Green, Preston. Removing obstructions occasioned by frost, and preventing freezing in cisterns, &c. Dec. 3, 1881.

5,315. W. Clark, London. Fixing window glass. (Com. by T. Tanner, Otago, U. S. A.) Dec. 5, 1881.

5,319. S. Sturm, Cologne. Increasing the heating-power of stoves and fireplaces. Dec. 5, 1881.

5,324. W. Saunders, Stepney. Implement and receiver for cleansing floors, &c. Dec. 6, 1881.

5,351. T. Rowan, London. Warming and ventilating, &c. Dec. 7, 1881.

5,371. J. Bissett, Glasgow. Apparatus for heating currents of air. Dec. 8, 1881.

5,377. D. G. Cameron, Lambeth. Water-closets. Dec. 8, 1881.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

Dec. 6, 1881.

4,731. J. H. Johnson, London. Compositions to render stone, wood, &c., impervious to air, water, &c. (Com. by G. O. Kramer & Co., Osnabrück, Prussia.) Oct. 28, 1881.

4,941. W. Cunningham, Dundee. Ventilating apparatus. Nov. 11, 1881.

Dec. 9, 1881.

3,416. J. C. Vanlohe, Providence, U.S.A. Sawing or cutting stone, &c. (Com. by P. Gay, Paris.) Aug. 6, 1881.

3,796. A. M. Clark, London. Lenses for use in pavement lights, &c. (Com. by P. Collamore, Boston, and N. Boyle, Springfield, U.S.A.) Aug. 31, 1881.

3,828. M. Merichenski, Poplar. Apparatus for raising and lowering gaseliers, &c. Sept. 2, 1881.

5,027. E. R. Hollands, Newington. Open stoves or firegrates, Nov. 16, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending December 10, 1881.*

1,812. A. E. Carey, Newhaven, and E. Latham, Birkenhead. Manufacture of concrete.

In order to mix the several materials of which concrete is composed thoroughly, they are placed in different hoppers which deliver the required quantities on to a mixing-pan. This pan is stationary, or capable of being rotated, and is fitted with movable or stationary mixing-arms. When the materials are thoroughly mixed in the pan they are delivered in a dry state to rotating-inclined cylinders, where they are damped with water, and again mixed, and from whence they are delivered ready for use. April 27, 1881. Price 8d.

1,900. T. Jackson, Edinburgh. Utilising waste heat of kitchen ranges, &c.

Shafts are made to enclose the water-pipes, cisterns, &c., the air in which is heated by the kitchen range, as all danger from frost is prevented. May 3, 1881. Price 9d.

1,903. M. Ingram, Manchester. Fireplaces for dwelling-houses.

The fireplace has bars in front, but a solid bottom. The products of combustion pass through an opening at the back of the fire downwards to the underside of the bottom. A door is provided to this space, in which is a grid, through which a small quantity of air can be admitted to consume the smoke. The gases then pass backwards again to a vertical flue leading to the chimney. Air chambers can be fitted at the sides of the grate for heating the air of the room. May 3, 1881. Price 6d.

1,927. H. Hill, Macclesfield. Manufacture of paving flags and tiles.

At the bottom of a mould, fragments of hard stone with their faces outwards are arranged, and a "grouting" of Portland cement is poured in. The backing may be composed of gravel and an inferior quality of cement. The flag is allowed to set, and then removed from the mould. May 4, 1881. Price 4d.

1,966. W. Jones, Manchester. Water-meters, &c.

A cylinder has two pistons connected by a rod. Between them is a lever, one end of which is moved by the pistons as they traverse to and fro in the cylinder, while the other end actuates a slide valve by which water is admitted to and withdrawn from the cylinder. The lever has a registering dial. (*Pro. Pro.*) May 5, 1881. Price 2d.

1,976. J. Carrick, Glasgow. Stoves and fireplaces.

Within a chamber of metal and glass is a basket containing the fire. The flue with a bell-mouthed opening is placed above the fire. The basket can be placed in any part of the chamber and the flue be made telescopic. May 6, 1881. Price 6d.

2,010. H. J. Haddan, Westminster. Warming apparatus.

An air supply-pipe passes from the hearth to the chimney, and is provided with a valve. The openings of the stove and of the chimney which communicate with the room may, therefore, be closed. (Com. by A. H. Godefroy, Versailles.) May 9, 1881. Price 2d.

3,707. W. R. Lake, London. Water-closet apparatus.

The pan is made of glass, blown in a mould, and inclosed in a metal jacket. The outlet is shaped so as to form a trap, and at the end of the outlet is a flap-valve. A valve is also fitted to the commencement of the outlet, which is raised by hand. The water is admitted to the basin automatically by a float, which, when the water falls below a certain level, opens a valve and admits more. (Com. by the Hartford Sanitary Plumbing Company, Hartford, U.S.A.) August 25, 1881. Price 6d.

Scott Memorial Fund.—A meeting is to be held at the rooms of the Royal Institute of British Architects, No. 9, Conduit-street, on this Friday, December 30th, at two o'clock p.m., to consider the transfer of the balance of the Scott Memorial Fund as an endowment of art teaching at the Royal Architectural Museum.

* Want of space compels us to omit those published in previous week.

HALF-TIMBER HOUSES WITHIN THE METROPOLITAN DISTRICT.

Mr. J. C. Taylor, of Acton, was summoned by the Local Board in respect of a building which he had erected in the High-street in contravention of the by-law.

Mr. Palmer, who appeared for the Local Board, said the building was a staircase consisting chiefly of wood constructed outside a house. According to the by-law, the building should be constructed of brick, stone, or other hard incombustible material.

Mr. Kisch, for the defendant, said externally it was covered with tiles, lime and mortar being inside.

Mr. Palmer, in reply, said there would not have been any objection to the building had it been all tiles. The by-law required the building to be constructed of hard and incombustible materials.

Mr. Kisch pointed out that the same kind of building was erected on the Bedford Park Estate,—a wooden frame with tiles outside.

Mr. Paget thought it was not in compliance with the by-law. It was what was [called a lath-and-plaster house, many hundreds of which existed all over the kingdom. Ultimately, Mr. Paget convicted the defendant, but allowed the summons to be adjourned for him to pull down the building.

LEAD POISONING.

Sir,—In so important a matter as lead poisoning, and which your valued paper has lately been noticing, it appears to me very desirable that any information on the matter derived from personal experience would not only be acceptable, but useful. The minds of many persons who possess a nervous temperament are unduly excited over this matter, which really need not excite alarm or anxiety, for it is well known that there was much truth in the crude saying of the ancients, "Nature abhors a vacuum," and "water must dissolve something," and the highly solvent power of water is universally admitted; yet it is equally well known it has in this matter a greater preference or affinity for some bodies than others. Thus water containing lime, magnesia, and earthy carbonates never can, or will, act on metallic bodies, and as the water we use for domestic purposes contains these, little fear need be entertained of any evil arising from its passing through leaden pipes in its transit. Take from the water these earthy salts and bodies, then the water immediately begins to act on the body (be it metal or otherwise) that it comes into contact with. A simple experiment will show the action of water on lead. Take a little solution of acetate lead,—known as Goulard's extract; if this is mixed with the purest of water (distilled water) a clear solution is obtained, showing its perfect solution. If the next in purity (rain-water) be used instead, turbidity is shown, proving a certain separation of the lead; but if ordinary water, as we obtain it from the water companies or from wells be used, then an opacity and milkiness are thrown out, showing perfect separation of the lead, simply arising from the fact that the water of the solution prefers, or has a greater affinity for, the earthy salts, and hence it parts with the lead not being able to hold it in solution. On this principle, then, there need be no fear of lead poisoning whilst we derive the water we use from the sources we do. But as in some parts of the country water is scarce, and the rain-water is caught and stored in leaden-lined tanks, then a certain acting on may be relied on, and the water contained is sure to indicate by the test of sulphurretted hydrogen lead in sufficient quantities to induce slow poisoning.

Sidney R. J. Smith, A.R.I.B.A.

CLERKS OF WORKS.

Sir,—Whether or not the suggestion of a "Clerk of Works" as to the desirability of forming an association such as he describes is ever likely to develop into a reality is a matter which at this early stage it would be premature to offer an opinion, but doubtless it will, as it deserves to do, engage the serious attention of the numerous body of men to whom it is especially addressed.

In nearly every sphere of professional and industrial occupations are to be found associations or clubs whose members at certain times and places meet together for some purpose or other of mutual interest; then surely there is nothing very extraordinary in the idea of an association of "Clerks of Works," who, it must be generally admitted, form an important factor in the building operations of the present day.

I, as one who feels proud to be classed among the number, although for various reasons cannot take any active part in the organisation, am quite prepared to enrol myself as a member when the proper time arrives, feeling certain it is a move in the right direction, and, if carefully worked out and soundly established, cannot fail to be the means of elevating and bringing into notice a class of men who at present, it is feared, are, like policemen, thought but little of until their services are needed.

Having said thus much I beg permission to offer a few remarks bearing upon the letter of an "Old Clerk of Works," wherein he calls upon architects to select their clerks of works from properly trained and qualified men. "Very good." But he would have better explained himself had he described the kind of training he meant. Perhaps it is only my ignorance, but I should have thought that architects are the best judges for themselves of the class of men who are most likely to best suit their purpose; and it is notorious that, as a rule, the men selected have been builders' foremen, having worked their way up to that position from journeymen, the instances being very rare indeed that they are drawn from the office,—for this reason, that such a one would have to submit to be led instead of being able to command.

It would be perfectly gratuitous to assert that clerks of works any more than other men are *perfect*, but it cannot be denied that there are, both in London and the provinces, many noble edifices which have been reared under the careful supervision of clerks of works whose names have been honourably mentioned in these columns, and who were thought by the architects who employed them not unworthy of their trust because they had not been trained as architects nor been born gentlemen.

In conclusion, I beg to suggest that all those clerks of works and builders' foremen who sympathise with this question shall send their names and addresses to you, sir,—stating their willingness to assist by a small subscription to meet the preliminary expenses; that these addresses shall be placed at the disposal of the originator; that he may communicate as he deem fit with the owners with a view to promote at first a private meeting for the purpose of organising a public meeting to be convened at the earliest opportunity after the necessary arrangements are made. With this end in view I place at his service my name and address.

Another Old Clerk of Works.

COURTESY TO CLERKS OF WORKS.

Sir,—Will you kindly allow an old subscriber and reader of the *Builder* for these last thirty years to have a little grumble?

I am an old clerk of works, and have had the honour of superintending the erection of many good works in this old England of ours, both for private individuals and her Majesty's War Department as well, and I have had some little experience with the Admiralty. I mention this to show I am somewhat competent to speak of the matter I wish to grumble about.

I mean as to the plan of advertising for clerks of works. In this matter I think a little needful reform is really necessary.

An advertisement appears in your journal asking for applications for an appointment, say, for a clerk of works to superintend the erection of a mansion; candidates are requested to state age, ability, experience, and to send references and copies of testimonials.

In all cases a number of men (many of whom are really up to their work), reply, and send all the necessary particulars. I am afraid to say how many apply. The usual result is they hear no more of their application. Surely, sir, common courtesy should induce the person who advertises to send a notice to the unsuccessful ones, or at least advertise in the same journal, as at first, saying the appointment was made.

I am induced to make this little growl, from the fact that I completed my last engagement in May of this year, and I have replied to some forty advertisements, and not in one instance have I been favoured with a reply,—this, too, in the face of the fact of my having sent an addressed envelope for a reply (yes or no). We clerks of works are a long-suffering race. It is all very well for architects to say they have no time. My experience of twenty-five years convinces me to the contrary; and the least a gentleman can do who asks a number of men to give their time to make an application for his work is to let them know when he has made his choice. A reform in this direction is much needed.

E. H. Cogswell.

Dangerous Chimney-stacks.—The daily papers have already described the terrible havoc caused by the blowing down, during the gale of Sunday morning last, of a great number of chimney-stacks belonging to houses in the neighbourhood of Pentonville and the New River Head. Heavy stacks of brickwork have fallen through the roofs of houses, and have been carried through two or three floors, destroying the furniture and injuring the inmates. At least one fatality is recorded, and there were many marvellous escapes. The public safety demands that the condition of the lofty chimney-stacks of many old houses should be carefully inspected by competent observers from time to time.

PROVIDENT INSTITUTION OF BUILDERS' FOREMEN AND CLERKS OF WORKS.

Sir,—Your correspondent of December 3rd (a "Clerk of Works"), is quite correct in supposing that there is a Clerks of Works and Builders' Foremen's Association; or, more properly speaking, a Provident Institution of Builders' Foremen and Clerks of Works, which has been established for the last forty years, not only for the advancement of its members, but to render assistance to the aged and afflicted members, widows, and orphans.

The society meet on the first and third Wednesdays in every month at 8.30 p.m. for the transaction of business and to admit members. The advantages of the institution are the mutual intercourse of the members, a valuable library of first-class works in connexion with the building trade, and occasional lectures to members and friends.

A copy of the rules and every information can be obtained on application by letter to the secretary, or by inquiry at the institution on any of their meeting nights, when the members will be pleased to see any person desirous of becoming a member.

It is open to clerks, or any foreman in the building trade who has held the position for over two years, and has not less than twelve men under him, and who can give satisfactory proofs of his ability and respectability.

J. W. H. Bedford,
Corresponding Secretary.

9, *Conduit-street.*

ANTHRACITE.

Sir,—I have no interest in any colliery, stove, or process of combustion, and therefore claim to be held as impartial a witness as your correspondents, Messrs. Smith & Stevens. I have been familiar for many years with Carmarthenshire and Pembrokeshire, where, as they observe, anthracite coals are burnt (although the rich Cannel coal is occasionally burnt in the drawing-room), and as a professional man, who has probably superintended the expenditure of more money in those counties than any other person now alive, I think I may be pardoned for expressing an opinion on the subject of their letter in the *Builder* of December 17th.

That opinion is, that it is extremely undesirable that anything should be said or printed tending to invalidate the force of your warning as to the danger attendant on the unwary consumption of a class of coal that is excellent in all other respects. As to that danger, I hold that there can be no more doubt than as to the similar risk attendant on the use, in France and Italy, of fine wood charcoal, the fatal effects of which, in a close apartment, are but too well known. It may, perhaps, be the case that with a brisk fire and carefully-regulated stove and flues the greater part of the carbonic acid gas formed in burning anthracite can be carried off; but it is extremely difficult to prove that this is, at any time, the case. The specific gravity of carbonic acid gas is rather more than half as much again as that of air, being from 1·51 to 1·52, if air is 1·0. As invisible, tasteless, and devoid of scent, unless when it contains some mixture of sulphur, its presence in an apartment is hard to detect, while only a violent draught can sweep such a heavy body up the chimney, as it naturally sinks to the floor. Now the great value of anthracite as fuel is the slow, steady combustion by which it maintains a constant heat; so that in theory, as well as in practice, the escape of gas into the room is for the most part steady, and in considerable quantity.

You will, perhaps, permit me to give my own first personal experience of the consumption of anthracite in a dwelling-house. I had occasion, many years ago, to visit Pembroke Dockyard professionally. I had been married little more than a year, and my wife accompanied me. It was before the South Wales Railway had made much progress, and we stopped for a night at Carmarthen. We had a sitting-room in the hotel, opening into a bedroom, and when my wife retired to undress, she left me by a very bright anthracite fire, of which the warmth was very agreeable. Becoming alarmed at my not following her for a long time, she returned to the sitting-room, and found me in a heavy sleep on the sofa. She had much difficulty in arousing me, opening the window, and providing a supply of fresh air. There is but little doubt, I think, that if I had been left undisturbed that sleep would have been my last. I apprehend that any one accustomed to the coal would have been aware of the danger of falling asleep by the side of an anthracite fire.

The fact is that all the safety signals of nature, of which pain is the principal, have in them something disagreeable. Such is the case with the acute pain experienced on any injury to the skin, occasioned from without. Such is the case with the noise of wheels, which we are now so careful to minimise, at the cost, more or less, of public safety. Such is the case with the warning which smoke gives of the presence of fire. And if we contrive, as we readily can do, to dispense with smoke, it becomes necessary to take such precautions in so doing as may prevent the additional danger to life resulting from the suppression of the danger signal. To urge, in opposition to this wise rule, the fallacy that "carbonic acid cannot be produced from anthracite coal without sufficient draught to carry it off," is to incur a responsibility which might very probably be attended by very unpleasant results.

C. E.

The Mortgage Company of England, Limited.—Our advertisement columns give the particulars of this undertaking. The list of directors,—Viscount Sherbrooke being chairman,—shows, beyond cavil, that it will be conducted honourably. It seems to us to have a good career before it.

WORKS IN INDIA.

SIR,—I trust you will give me space to say a few words in justice to myself, as Major Mant's principal assistant during the last seven years, with reference to your report of Mr. Spiers's communication at the meeting of the Royal Institute of British Architects on the 5th inst.

Mr. Spiers says that Major Mant trained Indian talent and employed native draughtsmen to work out his designs, especially ornamental detail.

As a fact, Major Mant did train two men, natives of the carpenter caste, who were excellent draughtsmen, and capable of doing original work; these men, who were brothers, were employed by him up to the middle of 1876, the time I joined him in Calcutta (not 1876, as stated by Mr. Spiers).

I, indeed, took their place in his office, as one of them fell ill, and returned with his brother to Bombay, where he died soon afterwards.

I managed Major Mant's office from 1875 to the time of his death. I had the assistance of the surviving brother on the Baroda and Kolhapur palaces, after we returned to Bombay in 1878, but, other than this, I had no assistance for original work from any native draughtsman.

I may also mention that the Baroda Library and Hospital were designed in 1880, not in 1876, as stated in the report.

I have been instructed by the Kolhapur and Baroda States to complete the working drawings for these palaces.

JOHN FOTHERINGHAM.

VARIORUM.

WE mentioned recently the importance to owners of house property and others of clauses contained in the "Conveyancing and Law of Property Act, 1881." A "Synopsis of this Act, with Index and Forms," by Mr. J. W. DAWSON, Solicitor, has now been published by Fry & Son.——Of the pile of Almanacks, Diaries, Christmas Numbers, Shilling Annuals, and such like, now before us, what are we to say? All are good and useful to a certain class. The "City Diary, 1882" (Collingridge), "Blackwood's Shilling Scribbling Diary," "The Railway Diary and Officials' Directory" (McCorquodale), and others, tell their own tale, and will be selected according to circumstances. The latter includes a list of the directors and officers of the independent lines of railway in the United Kingdom; the weekly traffic returns for 1881, with blank columns for 1882; and an abstract of four half-years' accounts of some of the principal companies.——Waterlow & Layton's "Surveyors', Architects', and Auctioneers' Diary and Almanac" cannot be too highly praised. The best version, which is, of course, a little dearer than some other diaries, gives a whole page for each day, is strongly bound, and contains a very large amount of information for the professions to which it is addressed. We can praise it honestly.——The Art-Union of London issues, as usual, its unique little Almanac, which is obtainable by all subscribers.——The Gog and Magog of all books of this kind, however, are the "British Almanac and Companion" and "Whitaker's Almanac," the latter again increased in size and value. If asked "which shall we take?" our clear, distinct, and well-thought-out answer is, "both." The British Almanac contains, as usual, a summary of the architectural progress of the year. ——"The Steadfast Aim" is the title of the extra Part of the *Quiver* for Christmas, 1881, and an excellent part it is, full of very good illustrations.——Under the title of "Gas and Electricity as Heating Agents," the important lecture delivered at Glasgow, by Dr. C. W. Siemens, is published by E. Stanford. There's matter in't. —— "The Gentleman's Annual, Christmas, 1881" (Chatto & Windus), consists of two stories only, both by ladies apparently, and both above the average,—"Mdlle. Angèle," by Alice Corkran, and "A Double Bond." We have read Miss Corkran's with particular pleasure. It is a story of Normandy life, fresh and natural.——Messrs. Bentley & Son follow suit in the game of 6d. editions of popular works, and the card they play is "The Ingoldsby Legends,"—giving the illustrations by Cruikshank, Leech, and Tenniel.——The New York *Sanitary Engineer* for December 1st contains a valuable article, by Professor Henry Morton, on "Electric Lighting: its Fire Risks and their Remedies." So considerable, it is said, has been the success of this periodical that it is to be hereafter published every week.

Christmas Cards.

Messrs. Eyre & Spottiswoode, of Great New-street, Her Majesty's printers, have sent us a large assortment of Christmas and New Year's cards. Some, of course, are less good than others, but the variety and the grace of many of them are remarkable. Mr. E. Maurice, Mr. Harry Arnold, and Miss Steel are their special artists. Such of our readers as want cards of this sort cannot do better than ask at their stationers' for Eyre & Spottiswoode's.

Miscellanea.

The Edison Electric Light.—A paper was read on Wednesday evening before the Society of Arts, by Mr. W. H. Preece, F.R.S., upon Electric Lighting at the Paris Electrical Exhibition. The lecturer traced the progress of the application of electricity to purposes of illumination from the early machines made by Professor Elias, of Haarlem, in 1842, and by Signor Pacinotti in 1861. The arc-lamps, which were described in detail, and the Lampe Soleil, which held an intermediate position between the arc and incandescent lights, had done good service. The rising favourite, however, was the incandescent light pure and simple. The chief lesson of the Paris Exhibition was that the arc-light was suited only for external illumination, while the incandescent lamps were eminently adapted for internal and for domestic illumination. Referring to devices for measuring the quantity of electricity consumed, he showed Mr. Edison's apparatus, an iron box like a small gas-meter. Inside is a glass cell containing two copper-plates which have been immersed in a solution of sulphate of copper. A definite proportion of the current passing through a house passes also through this cell, depositing itself upon one plate, and the weight of copper so deposited measures the current used. Many unkind things had been said, observed the lecturer, about Mr. Edison and his promises, and perhaps no one had been severer in this respect than himself. It was therefore some gratification for him to be able to announce his belief that Mr. Edison had at last solved the problem that he had set himself to solve. Mr. Johnson (Mr. Edison's representative in this country) explained that Mr. Edison contemplated the manufacture of electricity on a large scale for distribution over a wide area. It could be used without any skilled supervision, and could be applied to any purpose for which power was required, such as working sewing-machines, &c. The cost of the lamps was so slight that his company intended to supply them without any charge beyond that made for the electric current. Sir F. J. Bramwell, in bringing the discussion to a close, said he believed that we were near a practical possibility of applying electricity to the illumination of ordinary households.

Gas in Theatres.—The Lord Chamberlain has sent a circular to all the theatres in London, in which he says:—"The theatre at Vienna, which has now been destroyed, appears to have been fairly well arranged and supplied with many modern appliances for safety, but the explosion of gas on the stage extinguished the lights in the auditory. The consequent darkness added to the panic and confusion which ensued, and doubtless prevented the audience from availing themselves of the means of escape provided for them. The Lord Chamberlain has already called the attention of the managers to the extreme importance of an entirely distinct and separate system of lighting for the stage and auditory. At the annual inspection of the theatres in September last this was specially inquired into, when it appeared that, almost without exception, the houses were supplied with gas from two or more mains, and that a distinct service to the front and stage could be arranged without material difficulty or expense. The Lord Chamberlain is fully prepared to acknowledge the readiness of the managers to carry out any reasonable requirements for the safety and convenience of the public, and he feels convinced that they will agree with him that the experience of these recent calamities makes it imperative that the arrangements above alluded to should be carried out in all theatres with as little delay as possible. The Lord Chamberlain must, therefore, call on them to do so, and requests the manager of the —— Theatre, in acknowledging the receipt of this circular, at his earliest convenience, to state what steps he may propose to take in the matter."

Another Vienna Theatre on Fire.—Vienna has had another fright on Monday. In the southern suburb of Mätzleindorf a private theatre, with only wooden stairs, caught fire, and the stupidity of the officials was within an ace of causing another terrible loss of life.

The Contractor for Truro Cathedral is Mr. Shillitoe, late of the firm of Shillitoe & Morgan, of Doncaster. Mr. Shillitoe commenced active operations on Monday, December 19. The footings are in, and the crypt is well forward.

The Builders' Accident Insurance (Limited).—The Employers' Liability Act has now been in operation some months, and several important cases have been tried in the various courts throughout the country as to the responsibility and liability of employers of labour in case of accidents to their *employés*. Several companies take the risk by insuring employers against it. There is one company,—the Builders' Accident Insurance, Limited,—which differs from the others by being restricted to the building trades and those trades which are allied with it, such as timber merchants, slate merchants, and the many other trades more or less in connexion with building. Another feature in this company is that, as it is established and conducted by members of the trade, for mutual benefit, the profits, after paying losses and expenses, will be divided amongst the policyholders.

Electric Light for Lambeth.—A correspondent writes:—"The Lighting Committee of the Lambeth Vestry have decided to make a preliminary trial of the electric light from Westminster Bridge, along Westminster Bridge-road, Kennington-road, Kennington Park-road, to Kennington-gate, where the Brixton and Clapham roads meet, and have invited tenders accordingly. Since Mr. W. T. Wiseman's motion in the Lambeth Vestry on this subject, Camberwell and other vestries are taking the question up with great spirit. Instead of the proverbial parochial apathy reigning supreme, it is now a race among the parishes as to which shall have the electric light first. Perhaps Mr. Wiseman's startling statement as to a saving of 10,600*l.* a year on the tower system of lighting may have had something to do with the energy now displayed.

Reopening of the Royal Polytechnic Institution.—We observe that this favourite place of entertainment and instruction will be open for the delectation of the public during the forthcoming Christmas holiday. Its closing in September last called forth general expressions of regret. That there is a decided demand for such an institution appears to be the opinion of several ladies and gentlemen of high social position who have the welfare of the masses at heart. The Marchioness of Lothian, Earl Brownlow, and Mr. Samuel Morley, are amongst those who are named as having expressed a desire to contribute largely of their wealth to the re-establishment of the institution. We are informed that the transfer now halts simply for the want of some six or seven thousand pounds.

Banbridge Union.—The Guardians of this Union have had for some time under consideration a report, together with plans and specifications, by Messrs. Munday & Lidstone, of Westminster, for the entire reconstruction of the drainage arrangements at the Banbridge Workhouse. The proposal involved the substitution of the earth-closet or pail system in place of the existing cesspools, and an entirely new set of drains for slop-water. The construction of the new drains is to be postponed until the spring, but it is the intention of the Guardians to abolish the cesspools and construct new closets on the pail system at once.

Royal Italian Opera, Covent Garden.—In view of the strong feeling being at present manifested on all sides relative to the danger of theatres consequent upon the recent catastrophe at Vienna, Mr. Herbert F. Gye has thought that it may be of some service to persons interested in the matter, as well as to the public at large, to know the arrangements at this important theatre, and has, therefore, had a description of them printed. The means adopted (we are not speaking of structural arrangements) appear to be ample, and the circulation of the notice will serve to give confidence to the public.

Subterranean Telegraph Cables in Germany.—The network of underground cables in Germany, which was commenced in 1876, was completed this year. The total cost has been thirty million marks (1,500,000*l.*), and 221 towns, including the principal industrial and military centres of the Empire, are connected by the new system. The entire length of the cables is 5,463 kilomètres (about 3,400 miles), and of the wires 37,372 kilomètres (about 23,000 miles. Seventy river cables have been laid. The entire weight of the cables is stated to be 12,829,408 kilogrammes, or over 12,000 tons.

The New Leadenhall Market was opened by the Lord Mayor on the 15th inst. We shall have more to say about it in a future number. Messrs. Francis & Co., of Gray's Inn-road, are fitting up the whole of the shops in the market with their revolving shutters.

Obituary.—On Sunday, the 18th inst., at Alfred Lodge, East-hill, Wandsworth, died Mr. Alfred James Hiscocks, F.R.I.B.A., in the 76th year of his age. For thirty-seven years he had been District Surveyor of Wandsworth and Tooting. Death has been fearfully busy amongst members of the profession during the last few days.

TENDERS

For portion of work in completion, Granville Lodge, Redhill. Mr. Banister Fletcher, architect:—

King & Sons	£1,600	0	0
H. Burman	1,291	0	0
T. Heath	1,268	0	0
W. & H. Castle	1,209	0	0

For a house at Putney, for Mr. Peter Yapp. Mr. F. W. Hamilton, architect. Quantities by Mr. C. W. Brooks:—

Adamson & Sons	£1,678	0	0
Craske	1,618	0	0
Aviss & Co.	1,552	0	0
Pain	1,533	0	0
Aries (accepted)	1,507	0	0

For a villa residence, Melville-road, Falmouth, for Mr. William Hamilton. Mr. F. W. Hamilton, architect:—

A. E. Skinner (accepted)	£945	0	0

For rebuilding two houses in North-street, for Mr. Romain. Mr. C. A. Legg, architect:—

A. S. Judd (accepted).

For temporary chancel, sacristy, side-chapel, gallery, and laying on gas in Catholic Church, Portsmouth. Mr. J. S. Hansom, architect:—

Patman & Fotheringham (accepted)	£838	0	0

For additions and alterations to 1, Castelnau Villas, Barnes, for Mr. G. W. Jones. Mr. Frederick Rogers, architect:—

Potterton	£885	0	0
M'Manus	762	0	0
Gibbs & Flew	720	0	0
Jordan	689	0	0
Batstone	680	0	0
Woolf (accepted)	636	0	0

For the erection of the eastern portion of Raikes Memorial Church, Gloucester, including the tower up to the ringing-stage. Mr. Capel N. Tripp, architect. Quantities by Mr. Henry Carrington:—

Henry Lovatt, Wolverhampton	£3,459	0	0
Wall & Hook, Brimscombe	3,285	0	0
William Cullis, Hereford	3,150	0	0
D. C. Jones & Co., Gloucester	2,980	0	0
James Clutterbuck, Gloucester	2,900	0	0
Edward Godwin, Gloucester	2,811	0	0
White & Co., Evesham	2,800	0	0
Alfred King, Gloucester (accepted)	2,744	0	0

For rebuilding No. 43, Warner-street. Mr. Wm. Paice, architect:—

Aylett (accepted).

For certain works at Bedford and Norfolk Lodges. Mr. Wm. Paice, architect:—

W. Downs (accepted).

For the erection of boys' school, Hatfield-road, St. Albans. Messrs. J. & S. Flint Clarkson, architects. Quantities prepared by Messrs. Hodgson & Mundy:—

Miskin, St. Albans	£2,264	0	0
Ireson,* Northampton	2,160	0	0

* Revised and accepted at £2,210.

For the erection of a house for the manager at the Market Harborough Gas Works. Mr. John Eunson, engineer, and Mr. S. J. Newman, joint architects. Quantities prepared by Messrs. R. L. Curtis & Sons:—

Ireson, Northampton	£526	0	0
Barlow, Market Harborough	494	0	0

For memorial to the late Mr. William Smalley, for the Incorporated Society of Licensed Victuallers. Mr. H. J. Newton, architect:—

Cusworth & Sons	£117	0	0
Farmer & Brindley	98	0	0
Waite	72	0	0
Sansom (accepted)	65	0	0

For house at Kent Hatch, Westerham, exclusive of foundations. Mr. M. Ed. Macartney, architect. Quantities by Messrs. Evans & Deacon:—

Durtnell, Brasted	£5,275	0	0
Punnett & Sons, Tonbridge	5,145	6	1
Maides & Harper, Croydon	4,995	0	0
A. M. Deacon & Co., Norwood	4,698	0	0
Bromwich, Foster, & Co., Rugby	4,668	0	0

For alterations and additions to the North Surrey District schools, Anerley. Mr. A. G. Hennell, architect:—

Burman	£4,497	0	0
Mowlem & Co.	4,404	0	0
Amer	4,350	0	0
Turtle & Appleton	4,175	0	0
Crossley	4,099	0	0
Kirk & Randall	3,884	0	0
Macey	3,830	0	0
Masters	3,775	0	0
Careless	3,739	0	0
Candler	3,720	0	0
Bowyer	3,672	0	0
Hart (accepted)	3,556	0	0

For the construction of roads and sewers, &c., Bower Building Estate, Bedford. Mr. D. W. Aston, surveyor:—

Taylor & Co., Pimlico	£2,995	0	0
W. Harris, Camberwell	2,792	0	0
J. Pizzey, Hornsey	2,431	3	3
H. Morris & T. Peckham, Islington	2,290	0	0
W. Norris, Lambeth	2,243	0	0
Bottoms Bros., Lavender-hill	2,061	0	0
Wilson & Steddard, Leyton	1,875	0	0
J. Wood & Son, Leicester (accepted)	1,648	0	0

For two houses, Mann-street, Hastings, for Dr. Allen. Mr. W. H. Murray, architect:—

Stubberfield	£748	0	0
A. Vidler	697	0	0
A. H. White	650	0	0
Peter Phillips	634	0	0

Additions to the South London Brewery.—In reference to the list of tenders for these works, published by us last week, we are requested to state that Messrs. Adamson & Sons' tender was accepted because it was really the lowest, deducting the sum allowed by them for the gravel and sand to be excavated.

TO CORRESPONDENTS.

Thanks to many unknown friends for good wishes received. The unexpected pressure on our pages forces us to omit reference to a pile of communications.—T. S. (next week).—W. B. B. (next week).—S. H. (next week).—M. J. C. B. (shall appear).—A. Z. (under consideration).—F. S.—E. L.—Mrs. M.—E. H. C.—M. W.—W. W. L.—R. F.—F. W. H.—A. S. J.—H. T.—C. P.—J. S. H.—A. A.—S. P. D.—W. J. N.—H. & K.—T. J. S. & Co.—G. S.—M. & Co.—W. P.—C. & Son.—Mr. W.—M. & L.—H. F. G.—W. S.—A. A.—W. R. M.—E. P. W.—W. A.—D. W. A.—E. B.—C. C.—J. T. P.—T. G.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [Advt.

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